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ABSTRACT

This booklet uses materials developed during the High School Geography Project to guide teachers and other participants through the formulation of learning objectives, evaluation of those objectives, use of that evaluation to improve teaching, and the application of the process to the construction of an evaluation instrument. After completing the process, participants should be better able to apply evaluation data to assess and improve instructional procedures, measure student attitudes toward school and particular topics of study, and write essay and objectives questions to measure higher level cognitive growth in students. The booklet contains an instructor's guide and a participant's manual. The guide outlines the five parts of the process, specifying purpose, procedures, and materials needed, which include game materials and films. The Instructor's role in obtaining effective learning is then presented part by part. The participant's manual provides instruction for the various processes and specific content information. The five parts are flexible and may be consolidated or divided to accommodate available instructional periods. Films mentioned in the document are available through the catelogs of the Mountain Plains Educational Media Council and the Indiana University Audio-visual Center, under the title High School Geography: New Insights. (JH)

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# USING EVALUATION TO IMPROVE INSTRUCTION

by

Robert W. Richburg

INSTRUCTOR'S GUIDE
and
PARTICIPANT'S MANUAL

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Dana Kurfman, Director
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# USING EVALUATION TO IMPROVE INSTRUCTION
## Instructor's Guide

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Rationale for Using Evaluation to Improve Instruction

Evaluation has often been equated with testing for the purpose of grading. The grading process makes distinctions in the relative accomplishment of individual class members on important course objectives. Grading is a necessary and difficult task that is not often done well. Evaluation is often regarded solely as this process of assembling and administering tests at the conclusion of an instructional unit in order to have a tangible basis for assigning students' marks. The preoccupation with the administrative function of evaluation, however, has obscured the use of evaluation for another and possibly more important purpose. As Jerome Bruner has noted, "What is often overlooked is that examinations can be allies in the battle to improve curricula and instruction."*

Evaluation procedures can provide feedback about the effectiveness of the materials and strategies used in teaching. When an instructor determines how his group performs on specific objectives before and after his teaching, he obtains useful information that can help him make his objectives more realistic, or modify

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*J.S. Bruner, The Process of Education, Cambridge: Harvard University Press, 1960, p. 30.

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the materials and strategies he has employed. The result in both cases should be an improvement in teaching and, very likely, an improvement in learning by his students.

The use of evaluation data as feedback for improving instruction is likely to have other results, too. When grading is the only function of a teacher's evaluation program, his testing is likely to be limited to measuring the attainment of objectives which can be readily graded. Objectives involving the recall of information are the easiest for which to develop tests and determine grades. Attitudes, values and feelings, which are consistently postulated as the most important objectives in education, cannot ethically be graded. Nor can attitudes, values and feelings be measured reliably when the student realizes that he will be punished or rewarded on the basis of his responses. Thus, the teacher who evaluates only for the purpose of grading probably will not test for attitudinal or affective objectives.

However, the teacher who uses evaluation procedures to assess his own teaching can ethically measure affective objectives. Group data derived from such attitudinal measures as the semantic differential or Likert scales are reliable and valuable feedback. The added value of using tests as feedback is that a teacher's testing program communicates to the student, better than

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anything else a teacher does, what is important in his course. When affective objectives are important to a teacher but his tests ignore them, the student will not be convinced of their significance.

This kit focuses on evaluation procedures that will help participants improve their own teaching. In the process, participants become acquainted with some specific techniques that will help them in the more traditional use of evaluation. The kit will also provide evaluation procedures for some of the more difficult objectives to measure, such as higher level cognitive and affective objectives. The experience is intended to broaden teachers' knowledge about the kinds of learning that are measurable as well as to give teachers some appreciation for the reason these learnings should be measured.

Overview of the Kit

In the "Game of Farming," Part I, participants become involved in an agricultural investment game in which they simulate farmers during two different time periods in American history. This part will take 75 minutes to teach.

"The Objectives of the Game of Farming," Part II, begins with a class discussion in which participants are asked to formulate some objectives of the simulation

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Overview Chart of Teaching Times, Purposes, Procedures and Materials

| Parts and Time | Purpose | Procedures | Materials |
|---|---|---|---|
| I The "Game of Farming" 75 minutes | To involve participants in a simulation game which contains many kinds of learnings. | Participants, in pairs, assume the role of a farmer in Western Kansas and try to maximize their profits during two different periods of American history. | Game materials envelopes |
| II The Objectives of the "Game of Farming" 45 minutes | To analyze an exercise for the objectives it teaches. | Participants compare their objectives of the game with those of the game developer and view a video tape of students involved in the game. | Video tape of the "Game of Farming"<br>Handout sheet: "Some Objectives or Desired Learning Outcomes for the Game of Farming." |
| II Evaluating the Objectives 45 minutes | To demonstrate specific evaluation techniques for measuring the attainment of the objectives of the simulation game. | Participants study an evaluation instrument, read and discuss how the various items and scales on the instrument are constructed. | "Evaluation Instrument for the Game of Farming"<br>Handout sheet: "Some Objectives or Desired Learning Outcomes for the Game of Farming"<br>Reading: "Constructing and Interpreting an Evaluation Instrument" |
| IV Using Feedback Evaluation 45 minutes | To demonstrate how group evaluation data can be applied to improve instruction. | Participants work and discuss a programmed exercise on evaluation. | "A Programmed Exercise on Evaluation" + Answer Sheet<br>Handout sheet: "Some Objectives or Desired Learning Outcomes for the Game of Farming"<br>"Evaluation Instrument for the Game of Farming" |

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Overview Chart - continued from page

| | | | | |
|---|---|---|---|---|
| V | Application<br><br>90 minutes | To provide an opportunity to construct evaluation instruments similar to those introduced in the kit. | Participants are given a list of objectives for an activity on urban structure, and view a video tape of students involved in the activity. Then participants construct an evaluation instrument to measure the activity's objectives. | Video tape of "Portsville"<br>"Educational Objectives of Portsville"<br>"New Orleans East" topographic maps<br>"Holly Bay Community" sketch maps |

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game. They are assisted by viewing a video tape of high school students playing the game. After comparing their list of objectives with a list devised by the game developers, participants discuss the significance of some of the important learning outcomes. This part will take 45 minutes.

In Part III, "Evaluating the Objectives," participants study an evaluation instrument that measures the game's objectives. Participants read and discuss the items and scales that compose the instrument. If the readings are assigned to be done outside of class as is suggested, this part will require 45 minutes.

In Part IV, "Using Feedback Evaluation," participants work and discuss a programmed exercise which demonstrates how evaluation data can be utilized to improve teaching. This part will take 45 minutes.

In Part V, "Application," participants construct an evaluation instrument for another classroom activity. First, they are given the objectives of an activity and then, through video tape, view the activity being taught to students. Then participants construct an evaluation instrument. This part requires 90 minutes to teach.

The preceding outline and the Overview Chart on pages 4 and 5 have been included to give you a summary of the procedures, teaching time and materials comprising

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this kit. You will note that about five hours of classroom time are needed to complete the kit.

The five parts of the kit are flexible so that they may be combined into larger sections or divided into smaller segments depending on the length of your class period. For example, if you have one hour class periods, your five periods could be organized in this way:

meeting 1 - introduction and play a part of the "Game of Farming"

meeting 2 - complete the latter part of the "Game of Farming," determine the objectives of the game and view and discuss the video tape

Assign the class to study the evaluation instrument and its accompanying reading between meetings 2 and 3.

meeting 3 - discuss the evaluation instrument and begin work on the programmed exercise on evaluation

meeting 4 - discuss the programmed exercise and begin the application

meeting 5 - complete the application

If you meet for one and one half hour class periods, you would need three and one half class periods to complete the kit. In this case, your time would be organized in this way:

meeting 1 - introduction, play the "Game of Farming," and begin determining the objectives of the game, view the video tape.

Assign the class to study the evaluation instrument and its accompanying reading between meetings 1 and 2.

meeting 2 - discuss the evaluation instrument, and work through and discuss the programmed exercise on evaluation

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meeting 3 - begin the application section

meeting 4 - complete the application section in the first half hour of class

If your group meets for three hour periods, the full time of two meetings will be required to complete the kit. Your sessions might be organized in this way:

meeting 1 - introduction, play the "Game of Farming," discuss the objectives of the game and view the video tape, assign the study of the evaluation instrument and its accompanying reading to be done in class

meeting 2 - discuss the evaluation instrument, work through and discuss the programmed exercise on evaluation and do the application.

Participant Objectives

After completing this kit, the participants should be more likely to and better able to:

1. Apply evaluation data to assess and improve their instructional procedures.

2. Measure student attitudes toward school and particular topics of study.

3. Write essay and objective questions to measure higher level cognitive growth in students.

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## Planning Suggestions and Materials Check List

The Overview Chart on pages 4 and 5 of this Guide lists activities and materials for each part of the kit. For ease of reference, some advance planning suggestions and the materials required for each part of the kit are also described below.

For Part I of the kit you will need the "Game of Farming" materials. These include:

1 - envelope entitled "Student Materials, First Entry 1880-1882"

1 - envelope entitled "Student Materials, Second Entry 1919-1921"

Because the directions for playing the game are complex, you will want to familiarize yourself with them in advance of class.

For Part II you will need:

1 - Small reel of video tape, "Students Playing the Game of Farming." 11 minutes

30 - Handout sheets, "Some Objectives or Desired Learning Outcomes for the Game of Farming." These are found in the envelope entitled "Separates for the Evaluation Kit."

You will want to caution participants not to lose the handout sheets after you have distributed them for they will be needed again in Parts III and IV.

Remember that between the class meeting in which Part II is concluded and the meeting in which Part III is begun, you will want participants to do the assignment

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outlined on page 31 of this Guide, and on pages 18 to 19 of the Participant's Manual.

For Part II and Part V you will need a video tape console and monitor. Also, before teaching these parts you should be certain you have the appropriate tape ready to use. In this kit you will use portions of two different video tapes. The tape of students playing the "Game of Farming" is not contained on the reel you will use in Part V of this kit.

For Part III you will need:

- the "Evaluation Instrument for the Game of Farming," on page 20 to 25 of the Participant's Manual.
- the reading, "Constructing and Interpreting an Evaluation Instrument," on pages 26 to 41 of the Participant's Manual.

30 - handout sheets, "Some Objectives or Desired Learning Outcomes for the Game of Farming." This sheet was distributed to participants in Part II.

For Part IV you will need:

30 - copies of the seven-page "Programmed Exercise on Evaluation," found in the envelope entitled "Separates for the Evaluation Kit."

30 - copies of the "Answer Sheet for the Programmed Exercise on Evaluation," found in the envelope entitled "Separates for the Evaluation Kit."

30 - handout sheets, "Some Objectives or Desired Learning Outcomes for the Game of Farming." This sheet was distributed to participants in Part II.

For Part V you will need:

1 - video tape, Volume SS 812, "The Classroom As It Is," Part III. "Portsville." 15 minutes

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10 -"New Orleans East"topographic maps, packaged separately.

"Educational Objectives of Portsville," beginning on page 44 of the Participant's Manual.

"Holly Bay Community" sketch map, on page 47 of the Participant's Manual.

Your participants will need the topographic maps to write test items for the application in Part V. Ask them to share the maps since there are not enough for the entire class.

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## PART I: THE GAME OF FARMING

Begin Part I of the kit by explaining to your participants that for approximately 75 minutes they will be involved in a role-playing simulation exercise, "The Game of Farming." (It is contained in the High School Geography Project's unit, Manufacturing and Agriculture, published by The Macmillan Company.) They should participate in the simulation exercise as adults and not act as they believe high school students would. However, inform your group that as they go through this exercise, they should be conscious of the things students might learn from participating in it. When the exercise is completed, participants will analyze it to determine the learnings that have resulted. Later participants will see a video tape of high school students involved in the game.

The main purpose of this exercise is to illustrate some of the objectives--cognitive and affective--of the simulation. Therefore, you should not get involved in the details of the game so that you lose sight of the purpose in playing the game. While the instructions may appear complex, the actual playing of the "Game of Farming" moves rapidly once they are understood.

In the high school classroom version of the simulation, pairs of students assume the role of a farmer in

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Western Kansas during three different time periods--1880-82, 1919-21, and 1933-35. They are given specified amounts of land and money and then decide how to invest their money and manage their farm. After they make their yearly investment decisions, they learn how accurate these decisions were.

The selection of Western Kansas, a region of variable rainfall, demonstrates the farmer's dependence upon nature and some of the risks he takes. The time periods of the game illustrate the effects of natural conditions such as weather, plant and animal disease and insects, as well as market conditions. In a high school classroom the exercise is planned to take four and one-half to six hours.

However, your participants will play only the first two entries or time periods of the three time periods in the game. In these entries they will farm during the years 1880, 1881, and 1882 and again during 1920 and 1921. In this abbreviated form, your class should need no longer than 60 minutes to play. About 15 minutes should be allowed for class discussion.

Materials

Participant information for each of the time periods begins on page 5 of the Participant's Manual.

The following materials are provided for this exercise:

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One large envelope entitled "Student Materials, First Entry, 1880-1882" that contains:

1 - envelope labeled "1880" with:
    20 activity sheets
    20 role cards
    24 outcome cards for 1880

1 - envelope labeled "1881" with:
    20 activity sheets
    24 outcome cards for 1881

1 - envelope labeled "1882" with:
    20 activity sheets
    24 outcome cards for 1882

One large envelope entitled "Student Materials, Second Entry, 1919-1921" that contains:

1 - envelope labeled "1920" with:
    20 activity sheets
    24 outcome cards for 1920

1 - envelope labeled "1921" with:
    20 activity sheets
    24 outcome cards for 1921

Major Sections of the Exercise

The two major parts of the game are:

1. "Playing the Game, 1880-1882." Participants assume the roles of pioneers and homestead a farm during this period of the settlement of Western Kansas. Their

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first farming decisions are made on the basis of previous farming experiences which are described on their role cards. In subsequent years participants modify their crop or livestock investment decisions because of their success or failure or that of their neighbors. About 30 to 40 minutes are needed to play this section. A very brief class discussion precedes the next section of the game.

2. "Playing the Game, 1920-1921." During this period farm prices were inflated as a result of World War I and farmers prospered and expanded their operations. As the European market diminished after the war, the slump in prices had a serious effect on the Kansas farmer. The participants will have more information with which to work--information on rainfall, crop yields and market prices for the intervening years between the 1880's and the 1920's. Now the farms are larger; they have more money, different equipment, and a larger choice of crops and the option to irrigate. This second time period will take approximately 20 minutes. A brief discussion also follows.

Playing the Game, 1880-1882

To begin the simulation, you should ask the participants to read the directions for playing the game on pages 5 to 10 of the Participant's Manual. These directions will also help you manage the operation of the game.

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After participants have read the directions, you should pass out the role cards and instruct the participants that they will be working in pairs. Each pair assumes the role of one farmer to homestead their new farm during 1880, using past farming experience as outlined on their role card. After participants complete the 1881 and 1882 time periods, they can modify their crop or livestock investments as a result of their previous success or failure. Also, point out the railroad leaflet, on page 7 of the Participant's Manual, which gives the kind of information available to pioneers in this area in the 1880's. You should know that this railroad leaflet is not entirely accurate. It is more descriptive of Eastern Kansas than Western Kansas where the farming in the game takes place.

Next, you will want to distribute the work sheets entitled, "1880-1882 Activity Sheet," to each pair of participants. Have them fill in the top of the activity sheet according to the instructions on page 8 of the Participant's Manual. This includes the background from their role card, the year (1880), and the "capital," their total amount of money ($1500). A sample activity sheet is on page 17 of this Guide. You will want to refer to this sample as you read the directions for the game.

# 1880-1882 ACTIVITY SHEET

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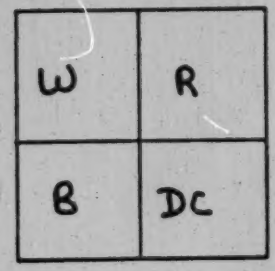
Year 1880 Background Gu. Capital $1,500

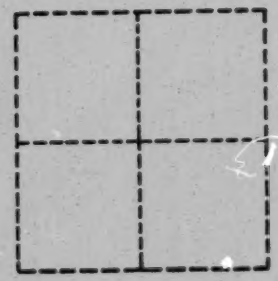
| | Allocation | Multiplier | Outcome |
|---|---|---|---|
| Wheat | $100 | 3 | $300 |
| Oats | $ | | $ |
| Barley | $100 | 2 | $200 |
| Rye | $100 | 2 | $200 |
| Corn | $ | | $ |
| Dairy cattle | $200 | 3 | $600 |
| Beef cattle | $ | | $ |
| Sheep | $ | | $ |
| Hogs | $300 | 1 | $300 |
| Cost of living | $ 500 | 0 | $ 0 |
| Rent | $ | 0 | $ 0 |
| Initial investment for dairying[1] | $200 | 0 | $ 0 |
| Savings | $ | 1 | $ |
| Total | $1500 | | $1600 |

Your Farm




Each small square represents 40 acres.

Rented Land



Costs per 40-Acre Unit

| | |
|---|---|
| **Crop** | |
| Wheat | $100 |
| Oats | 100 |
| Barley | 100 |
| Rye | 100 |
| Corn | 200 |
| **Livestock** | |
| Dairy cattle (maximum per 40 acres)[1, 2] | 400 |
| Beef cattle (maximum per 40 acres)[2] | 400 |
| Sheep (maximum per 40 acres)[2] | 400 |
| Hogs (maximum per farm)[3] | 600 |
| Rent | 100 |

[1]There is an extra expense of $200 for the first year with dairy cattle.
[2]Dairy cattle, beef cattle, and sheep investments are in $100 units with a $400 maximum investment per 40-acre unit. Livestock may be mixed in units of $100 on any 40 acres.
[3]Hogs are a straight cash investment in $100 units with a $600 maximum investment and they do not need allocated land.

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Have the participants note the crops and livestock they have available and the costs per 40-acre units. Participants should decide which crops they will grow and fill in the blank 160-acre farm diagram to the right of the activity sheet. They should also put the amount of money invested in each crop or livestock by that item in the "Allocations"column. Point out that dairy cattle, beef cattle and sheep investments are in $100 units with a $400 maximum for only one 40-acre unit. The livestock may be mixed in $100 units or any 40 acres. Hogs do not require special land and may be invested in $100 units up to $600 for their farm. Also note the $200 extra expense for dairy cattle the first year and the automatic $500 cost of living expense. Participants may put money in savings with no interest return and rent extra land at $100 for 40 acres.

When participants understand the mechanics of the allocations, you should let them work for 5 or 10 minutes to decide on their crops and livestock to invest their money. The sample activity sheet, on page 17 of this Guide, indicates that the German farmer raised 40 acres of wheat, 40 acres of barley and 40 acres of rye, each costing $100. In addition, he devoted 40 acres to pasture on which he grazed $200 worth of dairy cattle and raised $300 worth of hogs which required no special land. Five hundred dollars was allocated for cost of living

and he had to pay $200 for his initial investment in his dairy herd. His total expenditure was $1500. Participants should go through a similar decision-making process in completing their activity sheets.

Figuring Outcomes

When the participants have made allocations for their farm, you should refer them to the instructions on pages 9-10 of the Participant's Manual so they can calculate how successful the first year has been.

Have each pair of participants draw one "Outcome Card -1880" from the cards provided. They should read the introductory paragraph on the card which gives a description of the climatic conditions of the area and how they affected the farmer's crops. Information regarding plant or animal disease or market conditions is included. Now tell the participants to note the "multipliers" they received for each of the crops and livestock they worked with. A multiplier should be entered in the"Multiplier"column by the appropriate crop. Then tell the participants to multiply the amount of money allocated for that crop with the multiplier to determine the outcome for that crop.

Participants will recognize that multipliers differ from card to card. The differences are part of the design of the game. The outcomes, based on actual records

from a county in Western Kansas, reflect both the variations in natural conditions such as local weather, plant and animal diseases, and insect damages, as well as variations in market prices for particular commodities.

The sample activity sheet shows that the German farmer drew a card that listed a multiplier for wheat of 3; barley, 2; rye, 2; dairy cattle, 3; and hogs, 1. He entered these numbers in the "Multiplier" column next to the appropriate product. By multiplying the amount of money allocated to the various crops by the respective multipliers, the farmer figured his income for each 40 acres. On the sample sheet, the German farmer received a $300 return for the $100 invested in wheat; $200 for the $100 invested in barley; $200 for the $100 invested in rye; $600 for the $200 invested in pasture cattle; and he just broke even on his hogs. Of course, he gets no return for his $500 for cost of living and he receives no return on his savings. His total income, therefore, is $1600. His net income is $100. He now has $1600 to reinvest in his farm operation in 1881.

At the end of the 1880 round, you should allow the players to talk with their neighbors to find out how they fared and to determine why some farmers were more successful than others. They should try to obtain information that will help them make more reasonable allocations in the second year.

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The next two rounds of allocation, 1881 and 1882, should take less class time since participants are familiar with the roles and with the allocation sheets. The procedures for play are the same.

You will want to pass out a new activity sheet for the year 1881. Participants should enter their role at the top of the activity sheet and the amount of money they ended with in 1880. They then make their allocations for the year 1881, draw an outcome card for that year, and calculate the return on their investment.

Again, at the end of 1881 the players should be allowed to share information about the results of their farm operation and then immediately make their allocations for the year 1882.

Discussion of the 1880-1882 Period

When participants have figured the results of their farming operation for the year 1882, you will want to take time for a short discussion of their experiences.

The discussion question raised at this time will be useful background for participants when they analyze the objectives of the game in a later part of this kit. You may want to post on the blackboard some of the participants' responses to this question. To begin the discussion ask:

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"From your experience with farming in the 1880's, what kinds of factors influence a farmer's success or failure?"

Answers probably will be varied. The first three years, however, have been designed to illustrate primarily physical factors that influence farmers' management decisions. During 1880 for instance, rainfall was about average for the county; that is, about 18 inches of precipitation. This is adequate rainfall if it falls at the right time for a wide variety of crops. Like many marginally arid areas, however, great variations in annual rainfall may be expected. In 1881, for example, Settler County received 33 inches of precipitation, but in 1882 only 7 inches. As a result, those farmers who raised crops requiring humid conditions, such as corn, sustained substantial losses in 1882. Those who undertook a less intensive farm operation, such as wheat or grazing, fared better. Also, in marginally arid areas precipitation seems to fall in violent storms. So, even in years with adequate rainfall, yields may be reduced because of wind and hail damage.

Diseases such as rust and blight, or pests such as grasshoppers or corn borers, also diminish yields and affect profitability of the farm operation.

Participants might also point out that their roles might have influenced their success or failure during

the first year of farming. That is, if they came from an area that supported humid crops they may not have been successful if they tried humid crops in the dry-marginal area. All of these factors are taken into account in the outcome cards so that in the play of the game, some or all of the players experienced some of these problems. Now you are ready to begin the 1920-1921 period.

Playing the Game, 1920-1921

You should give the pairs of participants a new activity sheet entitled "1919-1921 Activity Sheet" and refer them to the directions on pages 10-12 of the Participant's Manual. (Tell the participants that the year 1919 is omitted.)

The participants enter 1920 with a 320-acre farm, $8500 capital, living expenses of $2000 per year, and a $1000 payment on mortgage and machinery. Each farmer has a hired laborer earning a salary of $600 per year.

By 1920 the farmers have much more knowledge about Western Kansas than the original homesteaders had. Much of this information is summarized on graphs on pages 13 to 16 in the Participant's Manual. The graphs explain how crop yields relate to rainfall, which crops do better in dry years, and the relationship between crop yield and crop price. Be sure to remind your group of the

availability of this data because an improved ability to read and interpret graphs is an objective of the game.

The procedures are the same as for the 1880's. Allocations are made in 80-acre units only, and you may have to point out that the diagram of the farm on the activity sheet shows the 80 acres outlined in solid black with a dotted line dividing it into two 40-acre parts.

Players have a choice of irrigating up to 80 acres of their land, and planting sugar beets, alfalfa and corn. There is an expense of $200 for the first year to the farmer who irrigated land. Alfalfa is the only crop that may be chosen for either irrigated or unirrigated land. All other crops are either exclusively irrigated crops, e.g., sugar beets, or corn, or unirrigated crops, e.g., wheat, barley or sorghum.

The livestock choices are the same as in the 1880's. As in the earlier period, there is an additional fee of $200 for the first year's investment for dairy cattle. Players may invest up to $2400 in beef cattle, dairy cattle or sheep. They may invest up to $600 in cattle or sheep on any 80 acres of land. There is no limit to the amount of investment in hogs. Land may be rented for $800 per 80 acres.

You will again let participants draw outcome cards for the years 1920 and 1921 so they can calculate the success or failure of their farming.

At the end of the 1920 time period, you should let the participants discuss their outcomes with their neighbors in order to share information and learn from one another.

Discussion of the 1920-1921 Period

When the participants have completed the 1920-1921 years, you will want to conduct again a short discussion to summarize some of the learnings that have taken place. Answers to discussion questions also will be useful to participants when they analyze the objectives of the game in Part II of this kit.

Begin by asking a question such as:

"What would you add to the list of factors that influence a farmer's success or failure?"

Responses to this question will vary. Participants should point out that new factors such as economic markets, political conditions, and new technology had to be taken into account during this time period. They should also point out that they had more knowledge about the area from the charts and graphs about climatic and economic conditions than they had available during the 1880's.

Another question you might wish to pose is, "Can you make any kinds of comparisons between farming and another type of economic activity, such as manufacturing, from having been involved in this game?"

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The answers you get to this question will depend upon the sophistication of the group. Similarities and differences such as the following examples probably will be mentioned.

1. Both farming and manufacturing require large capital investments.
2. Farming is a larger space user than manufacturing.
3. The farmer has less control over the quantity and quality of what he produces than the manufacturer.
4. The farmer has less control over the price he receives for his product than the manufacturer.
5. Farming is more of a seasonal activity than most forms of manufacturing.

Finally, you may want to determine if participants understand the principle of scarcity and how it functions in an agricultural context. Ask your class:

"From your experience as farmers, do you see any relationship between the quantity of an agricultural crop produced and the price that is paid for that product?"

The answer should be apparent but if it is not, the general relationship can be illustrated with the graphed data in the Participant's Manual. You could pick a crop on the graphs and show that, in most cases, as the quantity produced increases, the price of the crop drops. As the quantity of the crop decreases, the price goes up.

## PART II: THE OBJECTIVES OF THE GAME OF FARMING

This part of the kit focuses on the variety of objectives of the "Game of Farming." First, participants will determine the objectives. Then, they view an eleven-minute video tape of high school students participating in the game. The video tape helps participants determine what students are learning. Then they discuss the significance of some of the less easily recognized objectives of the game. Finally, they compare a list of objectives devised for the game by its developers with the list the participants have made.

The materials needed for this part include:

1 - The 11-minute video tape of the "Game of Farming," on the smaller of the two reels of video tape provided by the ACM Video Tape Project.

30 - Handout sheet, "Some Objectives or Desired Learning Outcomes of the Game of Farming."

You will have arranged previously for a video tape console and monitor to be used during this part. You also should preview the video tape of the "Game of Farming." Scanning the handout sheet may be helpful, too.

Initiate this part of the kit by asking the participants:

"What do you think students will learn from participating in this simulation game?"

As suggestions of objectives for the "Game of Farming" are made, list them on the chalkboard.

When the group has given you all the game's objectives that they can determine, introduce the video tape. Tell the participants that the eleven-minute video tape shows the game being used in an American history class with a group of eleventh graders. As they watch the tape, participants should look for additional game objectives that they have not listed previously. If participants have not already listed objectives in the affective domain, the video tape should make them aware of some of these.

When the video tape has been played, ask the class:

"Having viewed the tape, are there any objectives that you would add to your list?"

Near the end of the video tape sequence, the teacher asks his class if they can tell him what they have learned from having played the game. One of the boys in the class indicates a newly acquired feeling about farmers. Reacting to being wiped out financially in the depression, he comments that after farming his land for fifty years he would not leave it under any conditions. The student demonstrates a real empathy for the farmers who were forced to leave their land. Participants are likely to remember this sequence on the tape and it could serve as the stimulus for a discussion of attitudinal objectives.

Questions similar to the following might be useful to guide the discussion.

"Are feelings, such as those expressed by the boy in the video tape, as important objectives as the other objectives you have listed?"

Among educational theorists, attitudes, feelings and values are consistantly postulated as the most important outcomes of education. Courses are often justified on the ground that they will have an impact on students' attitudes long after the specific knowledge taught in the course has been forgotten. Continue this line of questioning by asking:

"How would you describe the way this group of students feel about the experience they were involved in?"

The majority of the class seemed to be interested in what they were doing and enjoying themselves. Now ask:

"Are student feelings or attitudes toward the subjects they study important objectives?"

As one educator recently noted, if students learn a great deal but dislike the experiences they are having, this is likely to be a deterrent to future learning. At a time when the continuance of learning is so necessary, teachers must be conscious of the attitude that is developing toward any subject being studied.

When this discussion is completed, hand out "Some Objectives or Desired Learning Outcomes of the Game of

Farming." Explain that the list was compiled by the developers of the game. Ask your participants to compare their objectives with those of the game developer and to note any differences.

The participants may have suggested objectives not on the game developer's list. Reassure them that the game can teach a broad range of objectives. Only some of the key objectives have been included by the game developer. If the participants have been involved in other HSGP teacher education kits, they may consider decision-making as an objective. It is a legitimate one if the teacher emphasizes decision-making in the play of the game. However, decision-making has been omitted from the game developer's list because it would unduly lengthen this discussion.

On the other hand, participants probably will not have thought of some of the objectives on the game developer's list. The class may want to discuss where in the game some of these learnings would take place.

When the participants are satisfied that they understand the objectives of the "Game of Farming," make the transition into Part III of the kit by asking:

"Would you have any difficulty evaluating student attainment of the objectives of the Game of Farming?"

Participants will probably agree that evaluating such a wide variety of objectives presents a complex

problem. In Part III participants will look at an evaluation instrument designed to measure the objectives of this simulation game. Tell the participants to keep the handout sheet, "Some Objectives or Desired Learning Outcomes of the Game of Farming," as it will be used in the next parts of the kit.

## PART III: EVALUATING THE OBJECTIVES

In this part of the kit, participants are assigned to study an evaluation instrument for the "Game of Farming." The assignment has two parts, both of which can be completed out of class. First, participants are asked to match test items with the specific objectives of the game. Then they study a reading which gives some specific suggestions for constructing the various kinds of items and scales found in the instrument. When the assignment has been completed, a class discussion highlights the important ideas.

To complete this part of the kit in the 45 minutes suggested, the assignment found on pages 18 to 19 of the Participant's Manual will have to be completed out of class. Review the assignment instructions so that you are familiar with what the participants will be doing. You will also want to preview the evaluation instrument and the reading on the construction and interpretation of the instrument.

When the group meets after having completed matching test items with objectives and the reading, you will want to conduct a class discussion about the assignment. As the discussion is carried on, the participants should have in front of them the evaluation instrument, the objectives of the game, and the reading on construction and interpreting an evaluation instrument.

You might begin the discussion by asking:

"You have tried to match the items on the instrument with the objectives of the game. Does the instrument measure the objectives of the game?"

The intention is to measure every objective by at least one test item. For your information, the objectives and items are matched below. You might post this chart so that the participants can compare it to the chart they were asked to complete in the assignment.

| Objective Number | Test Item Number |
|---|---|
| 1 | 2,3,4,7 |
| 2 | 1,6 |
| 3 | 8 |
| 4 | 5 |
| 5 | 9 |
| 6 | 11,13,16 |
| 7 | 15,17,18,19,20 |

Items 10, 12 and 14 do not relate to objectives of the game but provide reference data for use with items 11 and 13. This practice was explained on page 33 in the reading in the Participant's Manual.

To determine if there are ideas in the assignment which were not understood, you could ask questions similar to these examples.

"In doing this assignment you became familiar with a variety of testing techniques. Some of these were known to you before and some you were introduced to for the first time. Could you now construct these items and scales yourself?"

Because participants will have to construct an instrument like this in Part V of the kit, you should try to clarify any questions that they may raise. At this time, forestall any discussion of the uses of these instruments. This question should be raised later as a transition to Part IV.

When you have answered their questions regarding the construction of the items and scales, continue the discussion by focussing attention on Part I of the instrument. Remind the class that earlier in this kit, they discussed the relative importance of certain kinds of objectives in comparison with other objectives. Test items can be ordered in terms of relative importance, too. To bring this idea to the class's attention, ask:

"Are the questions included in Part I of this instrument measuring learnings of equal significance, or do some questions seem to be measuring more important learnings than other questions?"

If participants will look carefully at items 1 through 9, they will see that some of the items are measuring relatively trivial things. If this is not immediately apparent, however, have participants compare items 5 and 6. You might ask them:

"Which of these questions (5 or 6) seems to be testing a more important learning? Why?"

Participants probably will see that question 6 measures a relatively insignificant piece of information which is not likely to be of much use to the student who knows the answer. To answer question 5, however, the student will have to understand at least some of the principles involved in produce marketing. To some extent these principles can be generalized and, therefore, useful to the student in other contexts.

It may be of value to continue this line of questioning by asking the group:

"If your tests emphasized questions like number 6, would this have any influence on the way your students would study?"

If a teacher's examinations require the memorization of specific pieces of knowledge, the teacher should not be surprised to find his students preoccupied with the extraction of minutiae from their textbook and class notes.

At this point, you should shift the attention of your class from Part I of the evaluation instrument to the attitude measurement scales that are represented in Parts II, III, and IV. These scales are used for different purposes than the items in Part I, and they are subject to somewhat different interpretation procedures. You should be sure these differences are clarified for the participants.

This part of the discussion should provide a transition into Part IV of the kit which deals with the use of feedback evaluation data. To conclude the class discussion ask:

"Will all the parts of this instrument provide information that is usable to grade students?"

You should be absolutely certain that participants understand that the data derived from Parts II, III, and IV of the instrument cannot be used for grading purposes. The ethical problems involved in grading attitudes or appreciations should be obvious. There is also the problem of destroying the reliability of these instruments by rewarding or punishing students for their responses on them. When grades are at stake, items in Parts II, III, and IV are extremely vulnerable to a student's faking the attitude his teacher seems to want. When this idea seems to be understood, continue the questioning by asking:

"Since the items in Parts II, III, and IV cannot be used for grading, they must be included for some other evaluation purpose. Did your reading suggest any other uses for evaluation data besides grading?"

The reading did allude to the use of these items and scales in assessing the effectiveness of the materials and teaching strategies being used in the classroom.

Indicate to participants that in Part IV they will study the use of data from such scales for "feedback evaluation." That is, the results of the evaluation can indicate ways to modify teaching procedures.

## PART IV: USING FEEDBACK EVALUATION

In this part of the kit, participants are involved in a programmed exercise which demonstrates the use of evaluation data as feedback to improve teaching. The exercise, "A Programmed Exercise on Evaluation," will take participants about 20 minutes to work and could be done out of class. The discussion which follows the program will take another 25 minutes.

The materials needed for this part of the kit include: "A Programmed Exercise on Evaluation," the "Answer Sheet for the Programmed Exercise on Evaluation," the handout sheet, "Some Objectives or Desired Learning Outcomes of the Game of Farming," which was distributed in Part II, and the "Evaluation Instrument for the Game of Farming." All of these materials, except the evaluation instrument, are packaged separately in an envelope labeled "Separates for Evaluation Kit." The evaluation instrument is found on pages 20 to 25 of the Participant's Manual.

You will want to read through the program before you distribute it to participants. Directions for its use are attached. When you distribute the program and the answer sheet which accompanies it, be sure your class members have in front of them the handout sheet, "Objectives or Desired Learning Outcomes for the Game

of Farming," as well as the evaluation instrument. These materials are referred to in questions incorporated in the program.

If your group is unfamiliar with the way a linear program operates, explain that even though they are working with an answer sheet, the exercise is not a test. The answer sheets will not be looked at by anyone other than themselves. The answer sheet functions to make participants concentrate for a few seconds on the questions before the answers are provided.

When the class has completed the program, you will want to discuss its contents to ensure that the major ideas have been understood. The following questions can guide this discussion.

"According to the programmed exercise, what are some specific ways that evaluation data can be used to improve teaching?"

The exercise mentioned the utilization of pretest results to determine if instructional objectives are realistic. Pretest results also can show if objectives already have been satisfactorily accomplished. To determine which objectives have not been accomplished, you can compare pretest to posttest gain scores on test items related to the specific objectives. This technique, if applied to both knowledge and attitudinal objectives, will indicate where materials or particular teaching

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procedures are not doing the job intended. When these uses of evaluation data have been mentioned, continue the discussion by asking:

"Do you see any difficulty in utilizing the evaluation procedures suggested in this program in your classrooms?"

Several types of problems may occur to participants. One problem is likely to be the time factor involved in devising an evaluation instrument as complete as the one suggested. Considerable time is needed to isolate specific objectives and write test items that will provide precise data about the accomplishment or lack of accomplishment of these objectives. The need for time will be especially apparent if the broad range of objectives discussed in the program are evaluated.

Finally, you might wish to ask:

"Do you think the suggested evaluation procedures would improve a teacher's teaching? If so, why? If not, why not?"

When you feel you have adequately discussed the ideas in the programmed exercise, you will be ready to go on to Part V of the kit.

## PART V: APPLICATION

During the final two hours of this kit, participants can apply some of the evaluation ideas and techniques that they have learned about in previous parts of the kit. In this application, the participants are given the objectives for another classroom exercise and view a video tape of students participating in it to see how the objectives are taught. Then participants devise and critique evaluation items to measure the attainment of the objectives.

There is considerable flexibility in the way the application can be handled. If you have an experienced group of teachers who are already knowledgeable about test item writing, you may want to make the item-writing part of this application an out-of-class assignment. If, on the other hand, your group is less experienced, you will want to give much more careful directions and guidance and will probably want more of the work done in class. If the whole application assignment is done outside of class, only 45 minutes of class time will be needed for the opening and concluding discussions. If greater guidance is given, the application might require about 90 minutes of class time and another hour out of class.

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Materials

1 Video tape, Volume SS 812, "The Classroom As It Is," Part III. "Portsville." 15 minutes

"Educational Objectives for Portsville," pages 44-46 of Participant's Manual

10 "New Orleans East" topographic maps

"Holly Bay Community" sketch map, page 47 of the Participant's Manual

Materials necessary but not provided include video tape console and monitor.

Regardless of whether you intend the application to be done in or out of class, begin by directing the participants' attention to Part V, beginning on page 43 of their Manual, and to the section entitled, "Educational Objectives for Portsville." (The"Portsville"exercise will already be familiar to the participants if they worked the kit, Using Simulation to Involve Students, in which they viewed a video tape of students involved in "Portsville.")

Now tell the participants they are to devise items to measure these objectives. Since the "Portsville" objectives include attitudes as well as cognitive learnings, the application should give the participants some experience developing measurement instruments like those they examined for the "Game of Farming."

The class will need to review the video tape of "Portsville" in order to remember the context in which the objectives are conveyed. You can show the video tape as soon as the participants have read the objectives for "Portsville" and understand that they are to devise test items to measure these objectives. About 15 minutes are needed to show the tape.

After participants have viewed the tape, you will want to outline the number and kinds of items and scales you want them to construct. This assignment is flexible, fitting your time constraints. If you ask the group to write one or more test questions for each objective, the assignment will take a considerable amount of time. It is suggested, instead, that participants concentrate their attention on two or three objectives and attempt to write one or two types of questions for each objective.

Initiate your explanation of the assignment by discussing the extra materials that are provided for use in writing certain items. The "Holly Bay Community" sketch map on page 47 of the Participant's Manual, and the "New Orleans East" topographic map are provided as information sources to be utilized in writing questions for the knowledge and intellectual skill objectives of "Portsville." The practice of structuring questions in "a fresh setting" was introduced to participants in the

reading "Constructing and Interpreting an Evaluation Instrument." If students have been taught the principles governing land use relationships through the use of a particular map, you may only be testing ability to memorize when you use the same map in an examination. When you ask students to demonstrate their understanding of these principles with another map, the transfer raises the level of understanding necessary to answer the item correctly.

Some suggestions for the assignment you might make and examples of items which would satisfy each requirement are given below. Participants probably should, at least, have the opportunity to devise: 1) a semantic differential, 2) a few Likert Scale items, 3) a few objective items (particularly multiple choice), 4) an essay question. If participants seem unable to write items to satisfy a particular part of the assignment, you may want to help them by giving them a specific example from the following.

1. Utilizing the "New Orleans East" topographic map, write a multiple choice question that measures objective seven.

The following is an item which would satisfy this requirement:

"Which of the following would <u>not</u> represent an

example of man's ability to adapt his environment?"

A. The levees along the Mississippi River

B. The inner harbor navigation canal (in the northeast corner of the map)

C. The pumping station (29°54' N and 90°01' W)

*D. Bayou Fatima (29°52' N and 90°03' W)

2. Write an essay-type question for objective seven that also utilizes the "New Orleans East" map. Include a model answer as was suggested in the reading, "Constructing and Interpreting an Evaluation Instrument," page 30 of the Participant's Manual.

The following is an item which would satisfy this requirement:

Find three examples on the map that demonstrate how man can modify his physical environment or adapt to it. With each example, indicate the probable reason the modification or adaptation was made. (250 words, 30 points, 25 minutes time.)

An outline of a model answer for this essay might be similar to the following:

A. The levees along the Mississippi River represent a human modification of the physical environment to keep the meandering river in a channel.

B. The many pumping stations shown on the map

represent adaptations to keep dry the areas of the city that are below sea level.

C. The many canals shown on the map represent adaptations that facilitate the transport of goods between the Mississippi River and Lake Pontchartrain and other bodies of water.

3. Using the "Holly Bay Community" sketch map, construct an objective item to measure objective six.

The following is an item which would satisfy this requirement:

"If a person walked at the rate of a mile every twenty minutes, how long would it take him to walk by the nearest route from his home at point 3 on the map to the CBD of Holly Bay?"

A. one hour

*B. one hour and forty-five minutes

C. two and a half hours

D. three hours

4. Without utilizing any map source in structuring the question, write a multiple choice item that measures the accomplishment of objective five.

The following is an item which would satisfy this requirement:

"Which of the following is most likely to lead to the largest increase of population for a city?"

A. Establishment of recreation centers for teenagers

B. Introduction of a chain of shopping centers

*C. Construction of a steel plant

D. Improvement of the central business district

5. Utilizing the semantic differential technique, construct an instrument to measure objective two dealing with the students' attitude toward cities.

In fulfilling this requirement, the participants might list the following pairs of adjectives among those included in the instrument: rational-irrational, sensical-nonsensical, meaningful-nonmeaningful, interesting-boring, comprehensible-incomprehensible.

6. Utilizing the "Holly Bay Community" sketch map on page 47 of the Participant's Manual, write two multiple choice questions that measure objective three. The two items should not deal with the same land uses.

The following are examples which would satisfy this requirement:

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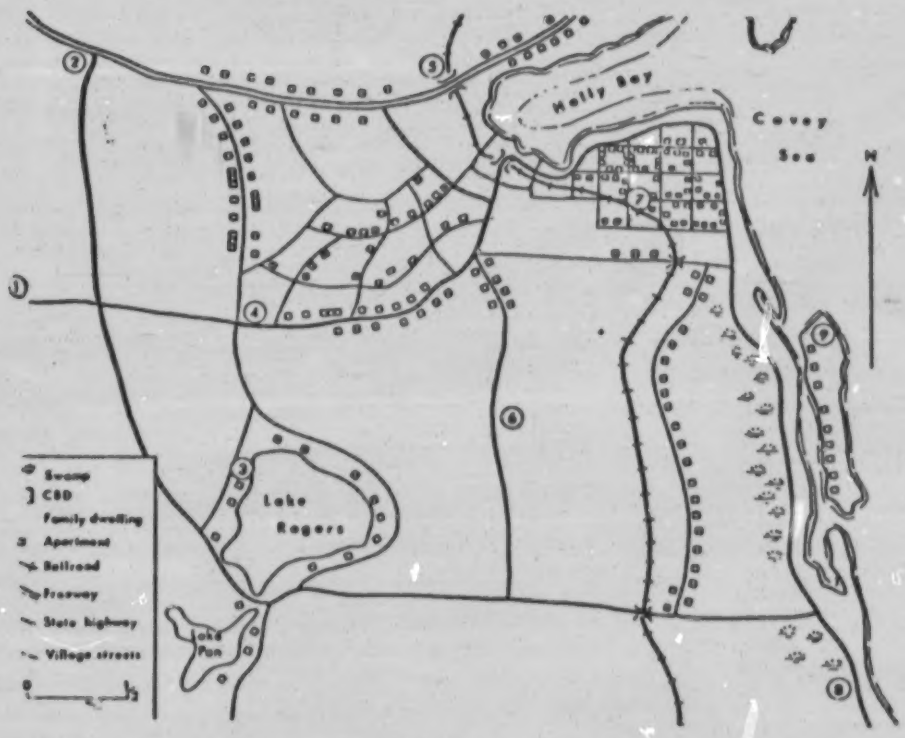
Holly Bay Community




Questions 1 and 2 refer to the above map.

In which area of this community is there most likely to be low income housing?

A. 4
*B. 7
C. 9
D. 3

In which of the following areas is there most likely to be high income residential land use?

*A. 3
B. 5
C. 6
D. 7

7. Write a series of Likert Scale items that measure objective two.

The following is an item which would satisfy this requirement:

Cities exhibit predictable patterns of organization. (SA A UN DA SDA)

When the participants have completed writing the items that you have assigned, you will want to conduct a discussion to bring some of the interesting items to the attention of the whole group. This could be done in any of several ways. You might select a few items from the participants' papers and write them on the chalk board for discussion. Or, you might ask for volunteers to share items they have written by putting them on the chalk board. When you have some examples in front of the class, ask the group to critique the items in terms of the following criteria:

1. Does the item measure the objective it purports to measure?

2. Is the item sound in terms of grammar and syntax?

3. Does the item violate any of the directives provided in the reading, "Constructing and Interpreting an Evaluation Instrument?"

If you have time, participants may find value in a

short discussion to review the idea of using evaluation data as feedback to improve instruction. Questions similar to the following would be helpful.

1. "If you administered an item related to objective six of "Portsville" and obtained no gain for your group from pretest to posttest, would you know where in the exercise your instruction had been inadequate?"

2. "Would having this information enable you to teach this objective more adequately the next time you taught "Portsville?"

If the video tape of "Portsville" is still fresh in the participants' minds, they will remember how the teacher introduces the "Portsville" map and discusses its scale. Participants should have ideas about ways the explanation could be improved if it was inadequately presented the first time.

TEACHING PROCEDURES FOR THE NEW SOCIAL STUDIES

# USING EVALUATION TO IMPROVE INSTRUCTION

by

Robert W. Richburg

PARTICIPANT'S MANUAL

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USING EVALUATION TO IMPROVE INSTRUCTION
Participant's Manual

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General Information

With the publication by The Macmillan Company of the High School Geography Project's year-long course Geography in an Urban Age, the Project has turned its attention to the development of teacher education materials. The kits of HSGP teacher education materials reflect the Project's emphasis on teaching strategies that encourage student inquiry and involvement. Like many of the HSGP units, the teaching procedures demonstrated in the teacher education kits are usable in other social studies courses, as well as geography.

Three HSGP teacher education kits have been prepared for use both by college students in social studies methods classes and by in-service teachers in workshops. Each kit is five hours in length and can be used independently or together with the other kits. Some of the exercises in each of the kits have been adapted from the HSGP course. While these exercises were originally intended for use with high school students, they have been tried out successfully with numerous adult groups also. All materials needed, such as aerial photos, maps and diagrams are provided in the kits. Video tapes are also available on loan. The three HSGP teacher education kits developed for 1970 tryout are:

Using Simulation to Involve Students

Using Media to Stimulate Inquiry

Using Evaluation to Improve Instruction

Each kit is based on the assumption that the best way to learn the advantages and disadvantages of any teaching strategy is to experience it. Consequently, the kits provide many opportunities for participation in the use of a variety of educational media, in role-playing simulations, and in evaluation exercises. Such experiences are subsequently analyzed in terms of their educational objectives and their usefulness in a variety of social studies classrooms. At the conclusion of each kit, participants are given an opportunity to apply what they have learned.

The HSGP teacher education materials have been developed with definite participant objectives in mind. Participants completing the HSGP teacher education materials should be both better able to and more likely to:

1. Use open-ended strategies, group work, and a variety of educational media in their teaching

2. Analyze inquiry and simulation exercises in terms of certain characteristics

3. Devise inquiry and simulation activities

4. Evaluate cognitive and affective objectives

5. Discuss the advantages and disadvantages of the open-ended strategies which the HSGP teacher education materials demonstrate

## Introduction to Using Evaluation to Improve Instruction

To most of us in the teaching profession the term "evaluation" recalls the onerous job of administering and grading tests. Grading is sometimes a distraction that saps time and energy while keeping us from pursuits that might be beneficial to our teaching. In this kit you will be introduced to another use of evaluation. As Jerome Bruner points out, evaluation can be an ally in the battle to improve curricula and instruction.

The content of the kit is divided into five parts. In these parts you will participate in a simulation game and then analyze and evaluate it. A brief description of each part of the kit follows.

Part I, Playing the Game of Farming. Working in pairs, you will simulate a farmer in Western Kansas during two different time periods of American history. In this role you will invest your land and money and then determine how you would have fared in each year farmed.

Part II, The Objectives of the Game of Farming. In a class discussion you analyze the game to determine what it teaches. You are aided by viewing a video tape of the game being played by high school students.

Part III, Evaluating the Objectives. You examine an instrument that was designed by the developers of the game to measure its objectives. You will learn how to develop

and interpret items and scales like those on the sample instrument.

Part IV, Using Feedback Evaluation. You work through a programmed exercise which demonstrates how evaluation data can be utilized to improve the instructional process.

Part V, Application. You have the opportunity to devise an evaluation instrument for another learning activity.

## PART I: THE GAME OF FARMING

For the next hour and a half you will participate in a simulation game that was designed for high school students. You should participate in the game as an adult, and try to consider the things high school students would learn from it. When you have completed the play of the game, your class will analyze it to determine what it teaches. ("The Game of Farming" is an activity contained in the High School Geography Project's Manufacturing and Agriculture unit published by The Macmillan Company.)

To play the game, you will assume the role of a farmer moving to Kansas in 1880. Study the description of the farmer's past experiences on the role card you receive to prepare to farm as you think he would have.

You have selected a 160-acre farm site to homestead. You have brought all the necessary farm equipment west with you. Since you are opening new land to agriculture, there are no farmers to talk to, no farms to visit to give you ideas about the crops and methods that succeed in this area. You will, therefore, have to rely on your past experience as a guide.

While traveling west you picked up a railroad leaflet telling about Western Kansas. You will find it on

page 7 of this Manual. This is all you know about the area in which you have settled.

The first step is to plan how you will allocate your money. In addition to the farm equipment, you have $1500 to start your farm but you must budget $500 for the cost of living during the first year. The cost of living must be set aside each year. You can spend money in $100 units only. The smallest unit of land you can work is 40 acres.

The crops you can plant include wheat, oats, barley, rye, and corn. It costs $100 to raise 40 acres of wheat, oats, barley or rye, but it costs $200 to raise 40 acres of corn.

You may invest in beef cattle, dairy cattle, sheep, and hogs. If you decide to start a dairy herd, an additional expense of $200 is required only during the first year. On any 40-acre tract you may graze from $100 to $400 worth of sheep, beef cattle, or dairy cattle. You may mix your investment in sheep, beef cattle, or dairy cattle on a 40-acre tract, but only in terms of $100 units, such as $100 in sheep and $300 in beef cattle. Hogs do not require special land but may forage on crop or pasture land. You may invest from $100 to $600 in hogs.

Additional land may be rented for $100 per 40-acre unit. If you do not choose to farm all your land, you

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## Five Million Acres

☞ Of Lands without Farmers await them.

These Lands are subject to Entry under the Pre-emption, Homestead and Timber Acts, and now is the time for those who desire to make homes for themselves and their children to secure them.

The rapid extension of the CENTRAL BRANCH places lands within easy reach of all, and during the present year there will be such a rush to this region that those who wish to obtain desirable Lands FREE, should go at once and secure them. In order that all may be informed of the requirements of the laws governing the securing of Government Land, we have prepared and published in this sheet the COMPLETE text of each of the Acts under which they are to be acquired, in convenient form for reference.

The advantages gained by seeking homes on and beyond the line of the CENTRAL BRANCH are many, and we enumerate a few of them.

1ST—No Land Grant Railroad runs into this section, hence, Pre-emptors and Homesteaders are entitled to acquire full quarter sections instead of eighty acre tracts.

2ND—The Central Branch is rapidly extending its road through the country comprised of these Lands, and settlers will have the advantage of being near to markets, schools, churches and all other necessities of civilized people, long before they have acquired the title to their Land, and before it is taxable. No taxes until title is complete.

3RD—The country is noted for healthfulness, being composed of beautiful rolling prairies and fertile valleys, FREE from swamps and malaria, and well watered by numerous running streams, the banks of which are covered with GOOD TIMBER.

4TH—These lands are FIRST-CLASS AGRICULTURAL LANDS, adapted to raising Corn, Winter Wheat, Spring Wheat and all other small grains, as well as Broom Corn and Vegetables, thus admitting a rotation of Crops. They are well watered, making excellent range for stock.

may rent some of it to other farmers for $100 per 40-acre unit. The game assumes you can always find someone to rent your available land or from whom you can rent. You need not try to rent from or to other participants.

All costs, such as taxes, seed, labor, supplies, and maintenance are included in the charges for each of the farming activities.

The Game Begins

Now look at the activity sheet for 1880 that your instructor has given you. Fill in the blank for your background according to the farmer's role you are playing, the year (1880), and the total amount of money you have ($1500) in the space next to "Capital." At the left is a list of all the crops and animals you may raise. The list indicates other possible expenses, such as cost of living, and has a space for a savings entry. Savings earn no interest.

The first column, "Allocations," is the only column you will fill in as you plan your farming activities. You fill in the other columns later. There is a sketch of your 160-acre farm on the right of the activity sheet. The costs for crops, livestock, and rent are also all listed on the activity sheet. As you decide how to use each 40-acre square, write the decision or its abbreviation on the map, calculate the expense, and write that

amount in the proper space in the "Allocations" column. For example, if you want to plant wheat in one 40-acre area, write "wheat" in one square and put $100 in the blank next to wheat in the "Allocations" column. Another sketch represents land you may rent.

The total you may spend is the figure you have recorded as "Capital" at the top of the activity sheet. Continue making allocations until you have utilized all your land or capital.

If, after you have made your allocations, you still have cash on hand but no land available, you may invest it in hogs, place it in savings, or rent more land.

Figuring Outcomes

Once you have made your allocations, you are ready to calculate how successful your farming has been. You will receive an outcome card. On it is a list of crops and livestock with a number or multiplier, printed after each commodity. If you planted 40 acres of corn and the outcome card shows a multiplier of 2 after corn, record the 2 in the "Multiplier" column on the activity sheet. Then multiply that number by the amount recorded in your "Allocations" column to figure the "Outcome," as indicated below.

| | Allocation | Multiplier | Outcome |
|---|---|---|---|
| Corn | $200 | 2 | $400 |

This operation should be repeated for each of the crops or animals you have chosen to raise.

Notice that cost of living and rent are multiplied by 0, and savings by 1.

After you have calculated each commodity and entered the amount in the "Outcome" column, total this column. The difference between this total and $1500 is your net profit or loss for the year. The total of the "Outcome" column is the capital you have to work with in 1881. The amount should be entered on the 1881 activity sheet.

Be sure to read the introductory paragraph on your outcome card to find out why some of your investments failed and others were successful. You will have a chance to discuss your success with other participants.

Now you are ready to make your allocations for 1881. Base your decisions not only on your past experience but also on what you have learned during the first year's farming. After calculating your outcome, you go on to 1882. The procedure is the same.

Playing the Game, 1920-21

The game reopens in 1920. (Note that the 1919 period has been omitted). Many changes have taken place since 1882. The changes that have the greatest impact on farming in Western Kansas include the development of

farm equipment such as the tractor and the combine and the building of irrigation systems. New crops such as alfalfa, sorghum, and sugar beets have been introduced and adopted by farmers.

Farmers have more knowledge about Western Kansas than the homesteaders had. Some of this information is summarized for you on graphs on pages 13 to 16 of this Manual.

Because you have purchased an additional 160 acres, you must make mortgage payments. You have also purchased a tractor and other machinery. Your payments for indebtedness on land and machinery amount to $1000 per year.

The prices you have been receiving for agricultural products are high, but your expenditures are also greater. Your living costs have risen to $2000 per year. You do have a greater amount of capital, however, and you go into the 1920 period with $8500.

Your farm now totals 320 acres and you must hire one laborer. His salary is $600 per year.

Many of your neighbors in Settler County have expanded their operations by renting land. You, too, may rent land at $800 for 80 acres. This fee includes the cost of the additional labor necessary for expanding your operation.

The activity sheet shows the cost for each crop or livestock. You have the option to plant unirrigated

wheat, barley, sorghum, or alfalfa, or irrigated sugar beets, alfalfa, or corn.

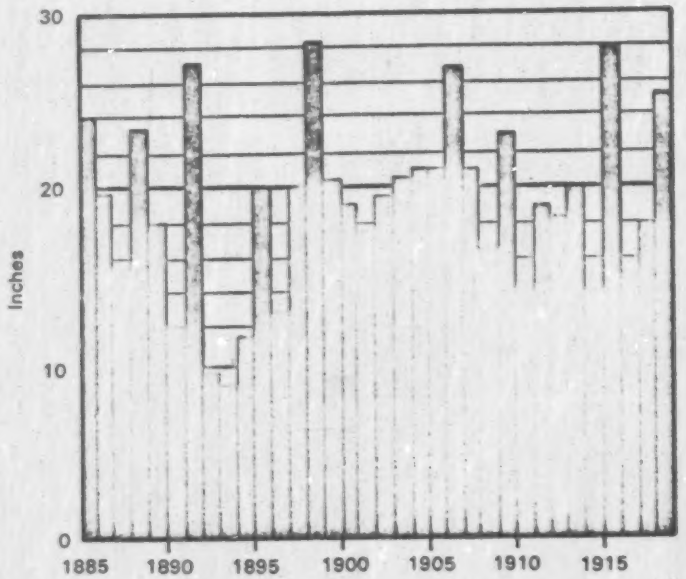
If you decide to plant irrigated crops, you must pay an additional $200 the first year, which represents the capital costs of installing irrigation facilities. You may irrigate only 80 acres.

Livestock choices include pasture (beef) cattle, dairy cattle, sheep, and hogs. There is an extra cost of $200 the first year you raise dairy cattle. Notice that you may raise up to $2400 worth of pasture cattle, dairy cattle, or sheep on your 320 acres and that each $600 of investment in livestock will require 80 acres of land. Livestock may be mixed in units of $100. There is no limit to how much money you can invest in hogs.

You are now ready to plan your strategy for playing the "Game of Farming" for the years 1920-21.

## AGRICULTURAL INFORMATION 1885-1918

**Annual precipitation**

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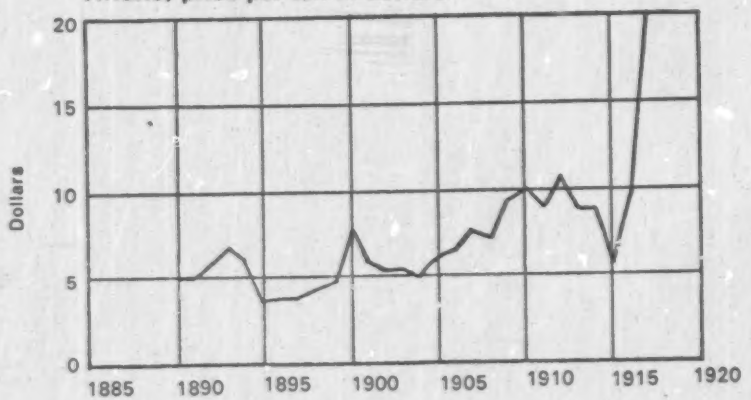
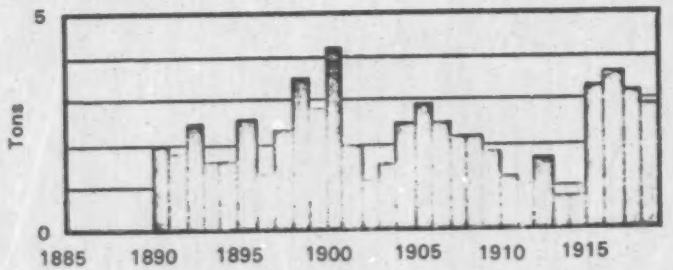
**Alfalfa, price per ton in dollars**




**Alfalfa yields, tons per acre**



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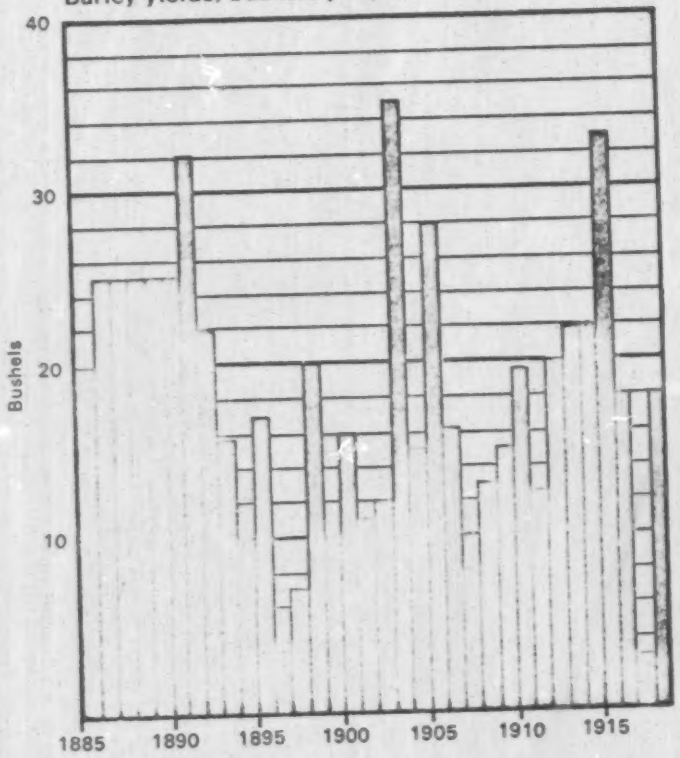
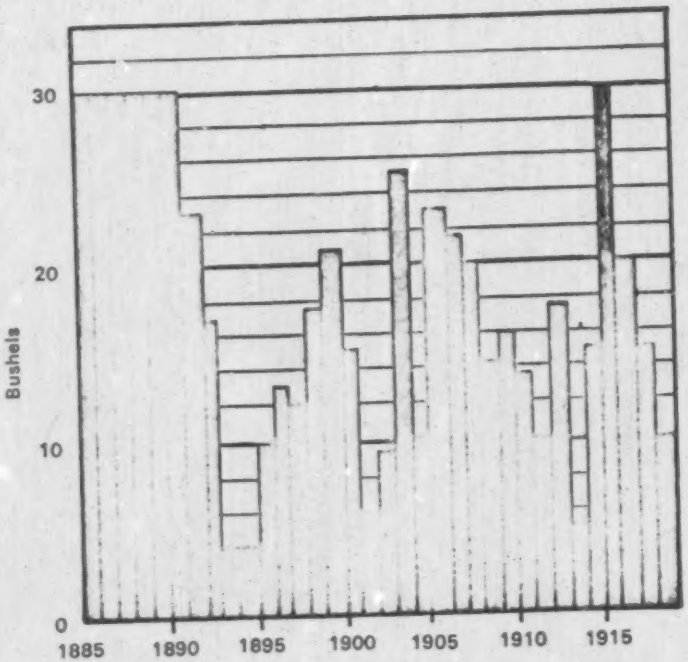
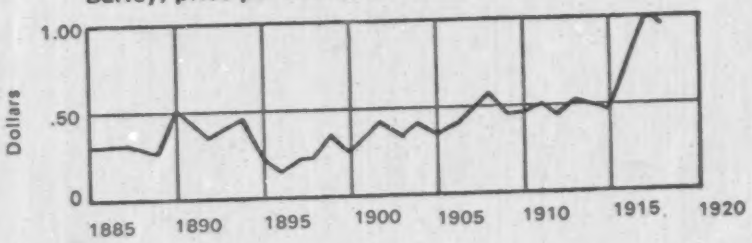
Barley yields, bushels per acre



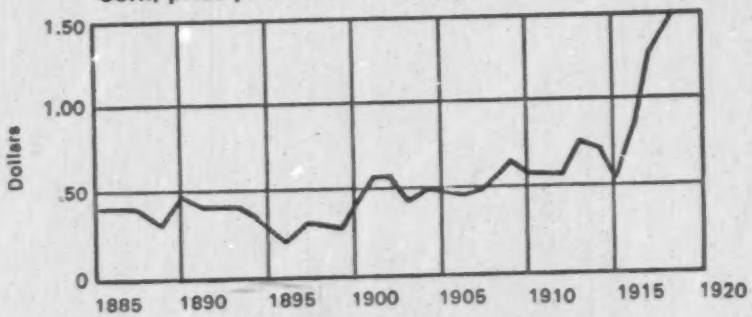

Corn yields, bushels per acre



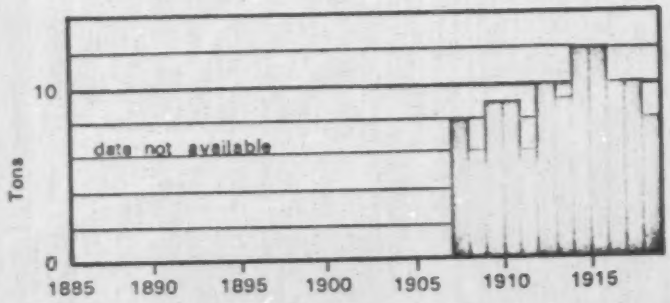

Barley, price per bushel in dollars



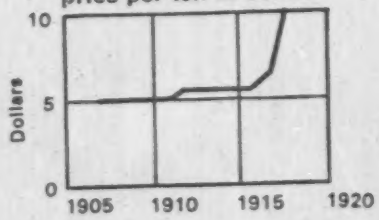

Corn, price per bushel in dollars



Sugar beet yields, tons per acre




Sugar beet,
price per ton in dollars

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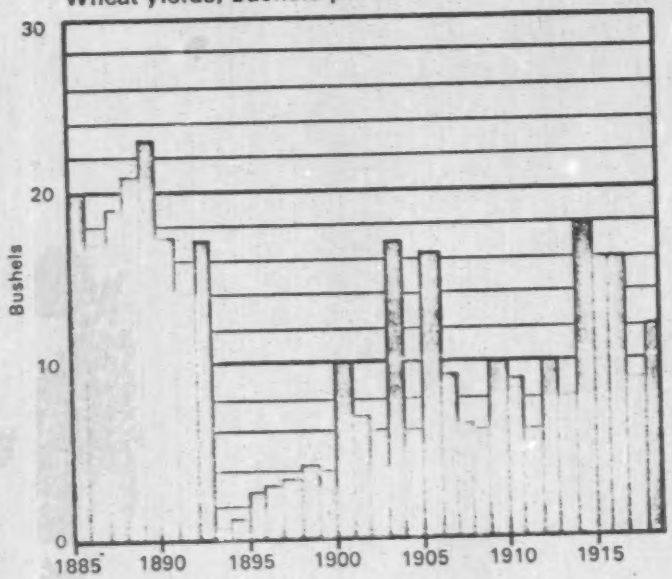
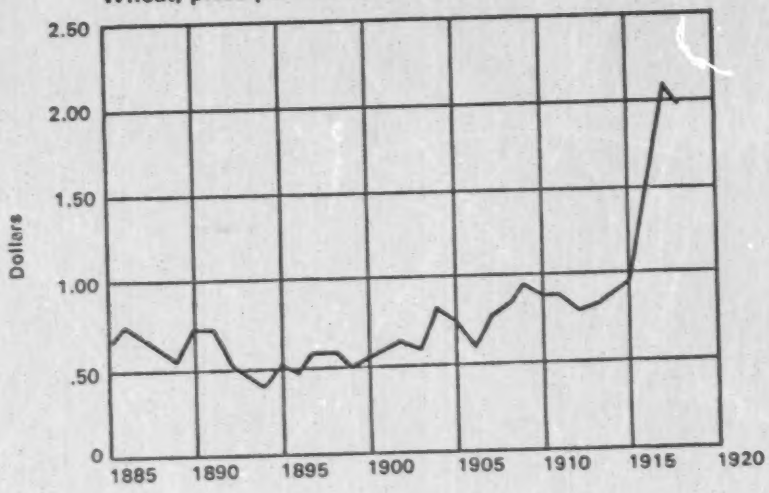
Wheat yields, bushels per acre




Wheat, price per bushel in dollars



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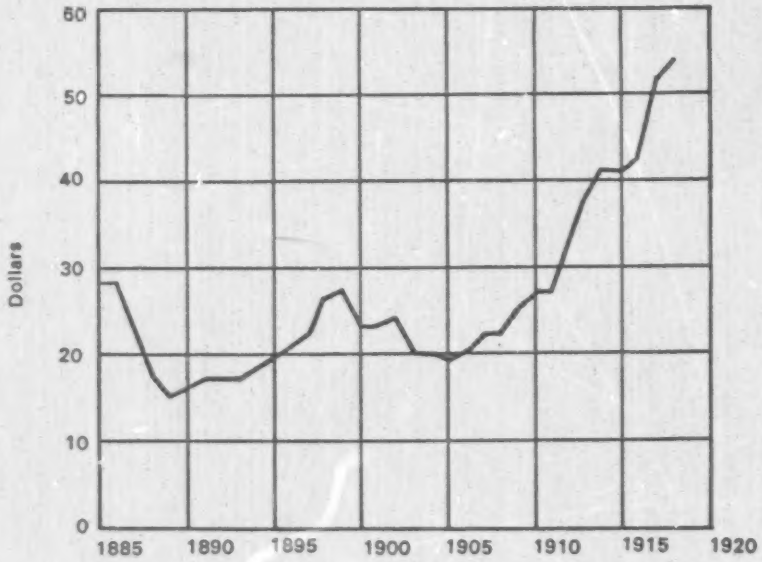
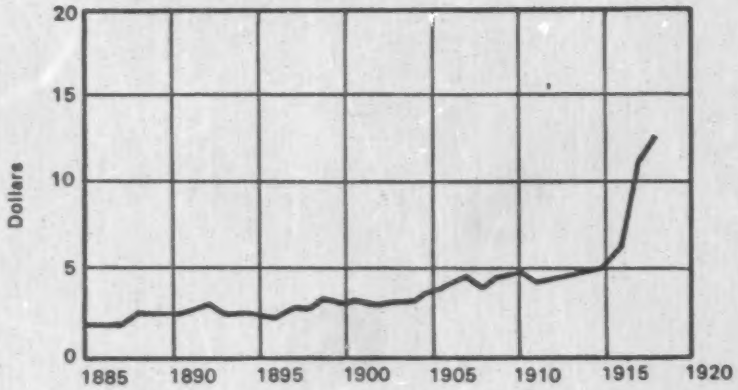
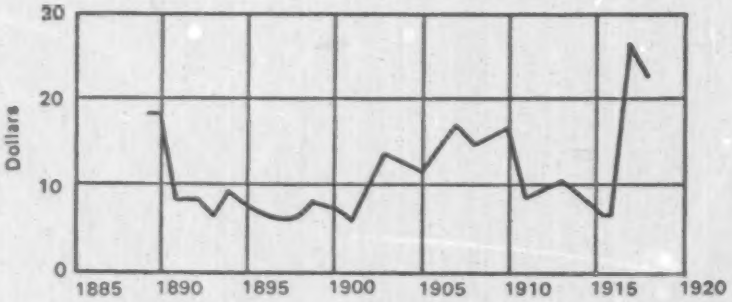
Beef cattle, value per head in dollars



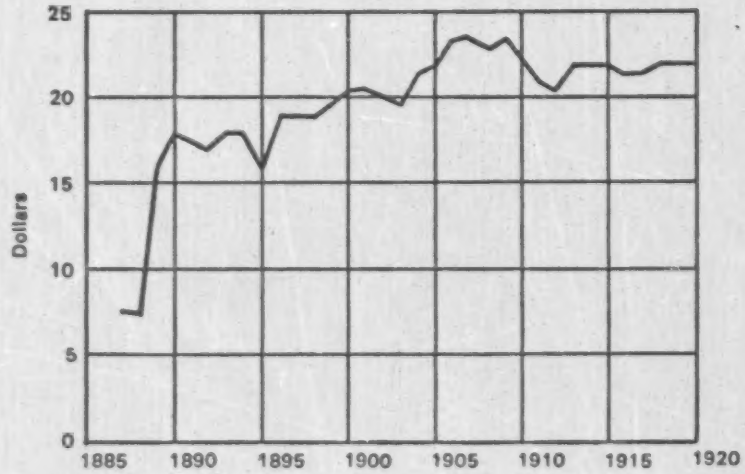

Sheep, price per head in dollars




Dairy cattle, value of milk products per head in dollars




Swine, value per head in dollars



## PART II: THE OBJECTIVES OF THE GAME OF FARMING

Now that you have played a part of the simulation game on farming, you will spend a few minutes discussing and analyzing it to determine what it teaches. After you have had the opportunity to list and discuss the objectives or learning outcomes of the game, you will see a video tape of an eleventh grade American history class playing the game. The taped session, which was completely unrehearsed, may indicate some learnings that you may not have considered before. As you watch the tape, ask yourself, "What are these students learning from this simulation?"

After viewing the video tape, you will be given a list of the objectives formulated by the game developers and will be asked to compare these with the objectives that your class has compiled. Discrepancies between the two lists are likely, for the class may have included objectives that the game developers have not listed, and vice versa. This should not disturb you. The game can be used to teach a wide range of objectives, and not all of them can be taught effectively at any one playing of the game. It is likely that the most important objectives will be included on both lists, however.

## PART III: EVALUATING THE OBJECTIVES

Grading is so important in American education that many people feel the purpose of testing or evaluation is only to determine grades. Actually, the purposes of evaluation are many and these different purposes require a variety of testing techniques.

In this part of the kit, you will analyze an evaluation instrument which utilizes several different evaluation techniques and which will yield data useful for several evaluation purposes. For this analysis you should look at the "Evaluation Instrument for the Game of Farming," on pages 20 to 25 of this Manual. You will also need the sheet entitled, "Some Objectives or Desired Learning Outcomes for the Game of Farming," which you were given in Part II of the kit. Since this evaluation instrument was devised by the developers of the game for the purpose of measuring its objectives, you should be able to match specific items on the instrument with the stated objectives of the game. To do this, set up two columns on a piece of paper, like this:

| Objective Number | Test Item Number |
|---|---|
| 1 | |
| 2 | |
| 3 | |
| 4 | |
| 5 | |
| 6 | |
| 7 | |

As you examine each of the test items, try to match them to a specific objective. When you have finished matching the items with the objectives, you should read "Constructing and Interpreting an Evaluation Instrument," which begins on page 26 of this Manual. This reading outlines the procedures you would follow to develop and interpret the various components of a test like your sample evaluation instrument. Study the reading very carefully, for later you will be asked to construct your own items and scales.

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# EVALUATION INSTRUMENT FOR THE GAME OF FARMING

Directions: Each of the questions or incomplete statements in Part I is followed by four suggested answers or completions. Select the one which is best in each case.

## Part I

1. Which of the following played the most important role in luring settlers to Western Kansas in the decades after the Civil War?
   - *A. Advertising by the railroad companies
   - B. The discovery of gold near Denver
   - C. Advertising by the Cattlemen's Associations and Homesteader's Union
   - D. The virtual disappearance of hostile Indians in the area

2. If a settler in Eastern Colorado in the 1880's was deciding whether to grow wheat or corn, which of the following factors should play the most important role in his decision?
   - A. The labor requirements of the crops
   - *B. The climatic requirements of the crops
   - C. The availability of appropriate machinery
   - D. The availability of livestock

3. Which of the factors listed as options for question 2 (A, B, C or D) would play a <u>less significant</u> role in a Colorado farmer's decision whether to grow wheat or corn during World War I?
   - A. The labor requirements of the crops
   - *B. The climatic requirements of the crops
   - C. The availability of appropriate machinery
   - D. The availability of livestock

4. In a paragraph of no more than 50 words explain your answer to question three.

5. Which of the following is an example of an event which could tend to cause a rise in the market price of corn?

A. A report of the prospect of a bumper crop throughout the U.S.
B. The report of excellent prospects for a large crop in Europe
C. A report that a much needed rain had fallen in the corn belt
*D. A report that an early frost had occurred in several sections of the corn belt

6. Which of the following acts or doctrines was most influential in the rapid settlement of the American West?

A. Embargo Act
B. Freeport Doctrine
*C. Homestead Act
D. Specie Circular

7. Which of the following would be the most likely outcome of a grain farmer's decision to irrigate his land?

A. An increase in the price he can obtain for each bushel
B. A decrease in his production costs
*C. An increase in his yield per acre
D. An increase of his business risks

8. Three of the following statements about agriculture and manufacturing are correct. Which one is NOT correct?

A. The farmer has less control over the quality of what he produces than the manufacturer.
*B. The farmer usually requires more capital for machinery than the manufacturer.
C. Farm work is more seasonal than manufacturing.
D. Farming requires greater amounts of space than manufacturing.

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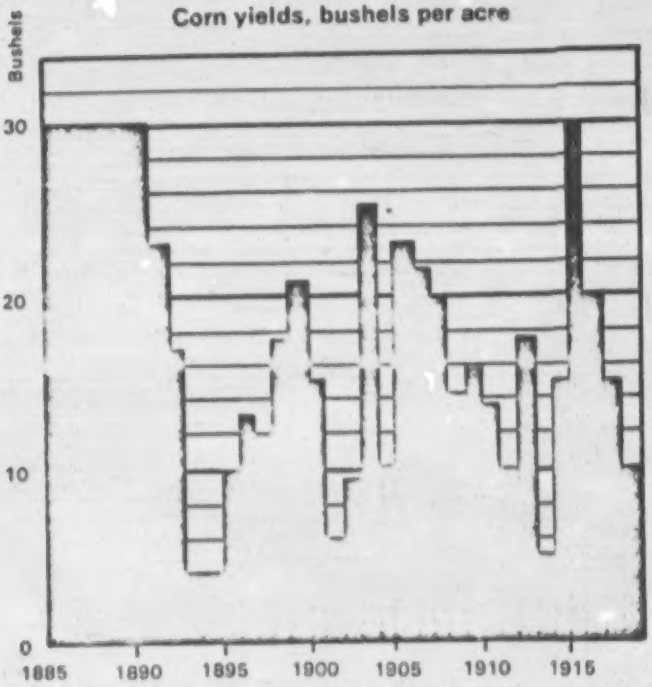


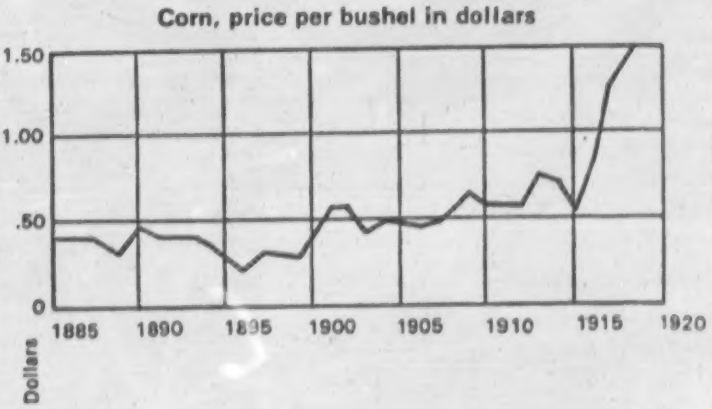


9. The data for the period from 1915-1920 on the above graphs indicate that price and production rates:

A. vary together
*B. are inversely variable
C. are unrelated
D. do not vary

Part II

In Part II, you are asked for your opinions. Questions 10 through 14 ask you to rate the following topics in terms of how interesting you think they would be to study.

A. dull
B. generally uninteresting
C. generally interesting
D. very interesting

____10. Manufacturing
____11. Settlement of the American West
____12. Politics
____13. Farming
____14. Kansas

Part III

Directions: In Part III we want to find out how you describe different things. As in Part II, there are no right and wrong answers. You will find a word printed like this:

FARMING

Look at the word; get an idea (image) of it in your own mind. Below the word you will find a number of words which describe farming. These words are put in pairs that have opposite meaning, like this:

Good — — — — — — — Bad

Hard — — — — — — — Easy

Between the words with opposite meaning are seven spaces. You are asked to fill in the space that you feel best describes farming. For example, if you feel farming is neither "good" nor "bad", you would fill in the space in the middle, like this:

Good — — — X — — — Bad

If you feel that the meaning of farming is a little more good than bad, you would put your mark like this:

Good — — X — — — — Bad

If you feel farming is very good, then you would mark like this:

Good X — — — — — — Bad

15. FARMERS

| | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| good | — | — | — | — | — | — | — | bad |
| smart | — | — | — | — | — | — | — | stupid |
| hard | — | — | — | — | — | — | — | easy |
| serious | — | — | — | — | — | — | — | funny |
| important | — | — | — | — | — | — | — | unimportant |
| proud | — | — | — | — | — | — | — | ashamed |
| happy | — | — | — | — | — | — | — | sad |
| clean | — | — | — | — | — | — | — | dirty |
| educated | — | — | — | — | — | — | — | uneducated |
| interesting | — | — | — | — | — | — | — | uninteresting |

Circle one if you are "in between" on your feelings

16. GEOGRAPHY

| | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| logical | — | — | — | — | — | — | — | illogical |
| meaningful | — | — | — | — | — | — | — | meaningless |
| hard | — | — | — | — | — | — | — | easy |
| clear | — | — | — | — | — | — | — | unclear |
| important | — | — | — | — | — | — | — | unimportant |
| useful | — | — | — | — | — | — | — | useless |
| analytical | — | — | — | — | — | — | — | descriptive |
| important for the future | — | — | — | — | — | — | — | not important for the future |
| interesting | — | — | — | — | — | — | — | uninteresting |
| precise | — | — | — | — | — | — | — | vague |

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Part IV

Directions: Each of the following statements is followed by five responses. Indicate how you feel about each statement by circling one of the responses.

Circle the SA if you "strongly agree" with the statement
Circle the A if you simply "agree" with the statement
Circle the UN if you are "uncertain" of your feelings about the statement
Circle the DA if you "disagree" with the statement
Circle the SDA if you "strongly disagree" with the statement

Here, also, there are no right answers; only your opinions are sought.

| | | | | | | |
|---|---|---|---|---|---|---|
| 17. | Farming does not require much education or intelligence | SA | A | UN | DA | SDA |
| 18. | Farming is probably an easier way to earn a living than most occupations. | SA | A | UN | DA | SDA |
| 19. | Farming is risky business | SA | A | UN | DA | SDA |
| 20. | It takes a lot of courage to go into farming. | SA | A | UN | DA | SDA |

## Constructing and Interpreting an Evaluation Instrument

The Evaluation Instrument for the "Game of Farming" contains four parts which illustrate one or more testing techniques.

Part I. Objective and essay questions measuring knowledge objectives

Part II. An interest scale measuring interest in subjects of study

Part III. A semantic differential scale measuring attitudes

Part IV. A Likert Scale measuring attitudes

Each of these techniques will yield data useful to the evaluation conscious teacher. Part I, dealing with knowledge objectives, yields information that will provide a tangible basis for assigning student grades. It will also provide information about how well the class as a group has performed on the knowledge or intellectual skill objectives for a particular unit or course. Parts II, III, and IV, while not providing information that is gradable, will yield data about group performance on attitudinal or appreciation objectives.

The following is a collection of essays on using these techniques. As you read them, you will want to refer back to the part of the evaluation instrument being described.

Objective and Essay Questions

Tests which measure knowledge, skills, and understandings have been conventionally divided into objective and essay categories. If the score on the test remains the same, regardless of who does the scoring, the test is considered objective. If the score differs with different scorers, the test is considered an essay or subjective test. Multiple choice questions like questions 1, 2, and 3 of Part I are, of course, examples of objective questions, while question 4 is an example of an essay or subjective question.

These types of questions have advantages and disadvantages. For instance, essay tests, though easily prepared, suffer from low scorer reliability, which means that the grades for the same essay will differ greatly from teacher to teacher and for the same teacher on two different evaluations. This problem is well illustrated by a recent research study. In the study 53 instructors were asked independently to rate 300 essays written by college freshmen on a nine point rating scale. When the graded essays were returned, 34 per cent of the ratings had received all nine ratings, 71 per cent of the essays had a range of eight ratings or more, 94 per cent had a range of seven or more, and 99 per cent had a range of six ratings or more. With essay tests,

the grade assigned largely depends on who is making the evaluation rather than on what is being evaluated.

With essay tests, too, the verbal ability of the student is often evaluated rather than his substantive knowledge. Meager knowledge can be embellished and consequently overrated.

Objective tests have substantially better scorer reliability than do essay tests, and they are not subject to contamination by writing or penmanship abilities. However, objective tests are difficult to construct and, if poorly constructed, may emphasize insignificant factual detail.

Constructing Essay Items. Select the questions with care. Since there can be only a few questions, those which deal with the most central and important topics should be used. When you have chosen your topics, be explicit in your instructions so that all examinees address themselves to the intended question. Some "test-wise" students will write as if they have misunderstood the directions to disguise their weakness on a topic. Words like "compare" and "contrast" are preferable in the instructions to terms such as "discuss," "write an essay on," etc.

As a rule, do not offer a choice of questions. This greatly reduces the already limited opportunity for assessing individual differences and, at the same

time, makes comparative scores more difficult to interpret.

It is a good idea to indicate the approximate length of the essay you expect the student to write and the credit that will be assigned to the essay relative to other portions of the test. Make sure that the examination is not too long for the allotted time. Ample time should be provided for the examinee to give some thought and planning to his answer as well as to the written effort.

Grading Essay Items. Prepare a model answer, outlining the main points to be covered in each question. The credit given for each item, as well as for each main point, should be decided in advance. When grading, you should read the examinations anonymously. If the examinee is known, the "halo" effect will consciously or unconsciously contaminate the ratings. The fact that a student is well-behaved (or ill-behaved) should not be spuriously "read into" test scores.

To avoid the "serial" effect, quickly read the first question on all papers and place each into one of three (or five) categories from poor to excellent. Otherwise, an exam following two or three excellent papers is underrated due to the serial effect. Likewise, an average paper may appear excellent if preceded by several poor efforts.

Grade the answers to the first question on all papers, assigning a point value, before going to the second question. If this is not done, the "halo" from the previous items will color the evaluation on the subsequent items. The student's effort on question two should be evaluated independently of his performance on question one.

Constructing Objective Items. Begin by formulating a "blueprint" or plan in order that the various aspects of the content are weighted proportionately. Proportional weighting will not occur if you write items randomly until you have the desired number of questions.

Try to keep items "criterion-oriented." Ask yourself, "What are the important concepts of this unit; what are my objectives?" This step will help you to avoid trivial "so what" items. Also try not to use the stereotyped phrasing of the textbook. Use new text, graph, or map materials to reconstruct the meaning in a fresh setting. This will raise the level of understanding necessary to be credited with the item and will "uncondition" the pupils away from memorization without understanding.

Make the test items easy to read unless the measurement of reading ability is your objective. This rule is especially important at the elementary school level. If an assessment of arithmetic reasoning is desired, the

assessment should not be contaminated by measuring reading ability concurrently.

Allow the position of the correct answer to vary randomly over the various positions. A teacher whose true-false items are false most of the time will find that his students will be able to guess with greater than chance success. The same is true if a test is keyed in some other non-chance fashion. For example, if an expression such as "none of the above," "more than one of the above," "all of the above," or "both A and B," etc., is consistently keyed correct or incorrect, an irrelevant clue is given to the "test-wise" student.

Finally, because of the severe limitations on teachers' time, you should probably never allow an examination to leave the classroom even after it has been given. Often, it is not practical for a teacher to compose an entirely new and well-designed test for each grading period or semester. On the other hand, an examination should not be repeatedly used without change, but should be kept current by periodic updating.

* * *

An Interest Measurement Scale

The interest measurement technique exemplified in Part II of the "Evaluation Instrument for the Game of Farming" was devised by curriculum developers to measure

student interest in school and in the various subjects studied. Like the other attitude scales used in the instrument, it is a relatively unrefined technique. Most attitude scales have recognized limitations in terms of reliability when used to gain insights about the attitudes of individuals. They can, however, be invaluable tools for teachers who wish to measure the impact of their teaching on the attitudes of their class as a group.

Constructing an Interest Measurement Scale. The interest measurement scale is a simple procedure. The evaluator establishes four options, A, B, C, and D, which represent points on an interest continuum.

A. dull

B. generally uninteresting

C. generally interesting

D. very interesting

He then lists the topics or ideas that are to be studied and asks the respondents to react to each topic in terms of how interesting he thinks it is. For example, "Rate the following topics in terms of how interesting you think they would be to study."

_____1. The Civil War

_____2. The period of reconstruction

_____3. The settlement of the American West

To have some points of comparison in assessing the degree of interest your students have registered, you will probably want to include topics other than those actually to be studied. This, of course, is the reason for the inclusion of items 10, 12, and 14 in Part II of the evaluation instrument. "Sports" is a good comparison topic to include in an interest scale. Students will usually rate sports as highly interesting. Any course topic which was rated as high as "sports" at the conclusion of a unit of study could probably be interpreted as having been very successful in stimulating student interest.

Interpreting the Interest Scale. The interest scale, like the other attitudinal measures that will be studied, should be administered before and after the unit you wish to evaluate. In each administration you will have your students register the degree of interest they have for each topic listed. To score each topic, tabulate the number of A's, B's, C's, and D's registered. Then assign a weighted value to each of the four options. The "very interesting" response receives a 4 value, and so on to the "dull" response which would receive a value of 1. You determine a class mean for each topic by totaling the weighted values and dividing by the number of students responding.

The following data was collected from the administration

of this interest scale before and after a geography unit on manufacturing and agriculture was taught.

| Topic | Class Mean for Pretest | Class Mean for Posttest |
|---|---|---|
| 1) Politics | 2.62 | 2.65 |
| 2) Farming | 2.02 | 3.05 |
| 3) Japan | 2.70 | 2.69 |
| 4) Manufacturing | 2.33 | 2.57 |

Topics 1 and 3 were not a part of the unit of study and showed little, if any, gain in student interest. Topics 2 and 4 were emphasized in the unit and did show substantial gains. There is some additional valuable feedback in relation to topics 2 and 4. Both of these topics received equal class time and yet topic 2 generated considerably more interest. The teacher who wanted a high student interest in the subject he is teaching would use this evaluation data by attempting to replicate the procedures or materials employed in teaching topic 2 for future topics of study.

* * *

The Semantic Differential

The semantic differential technique, which is exemplified in Part III of the evaluation instrument, is another attitude measurement scale. The technique was developed by Charles E. Osgood as a part of a research

study of meaning. The instrument has been used to explore the images or meanings that people have of ideas or things, from brands of cigarettes to socialism. For whatever is being rated, the evaluator selects a number of bipolar adjectives or adjective phrases which will define the dimensions of meaning. For example, in determining the image that people have of a particular brand of cigarette, a researcher might choose: mild-strong, cool-hot, masculine-feminine, a quick smoke-a long smoke. These adjectives are separated by a seven point scale on which the respondent registers his attitude toward the brand of cigarettes. Care must be taken that the two adjectives at the extremes really are opposed and do define some kind of continuum or dimension between them.

Constructing a Semantic Differential. Researchers randomly assign the location of the positive end of the continuum, so that in the case of the cigarette research "mild," "cool," and "a long smoke" would probably not fall on the same side. For simplicity in organizing a semantic differential for yourself, however, you may not want to be so precise. Scoring and interpreting will be easier if you arrange your pairs of adjectives so that any change taking place from the first administration of the instrument to the second will move from the right to the left of each continuum. For

instance, if you are interested in "how smart," "how important," and "how educated" students think farmers are, and want the lessons that you had prepared to move the students to more favorable attitudes on all three continua, you would put "smart," "important," and "educated" on the left-hand column. "Stupid," "unimportant," and "uneducated" would be placed in the right-hand column.

You may include other pairs of adjectives that are not of real interest to you just to veil your intent. In the measurement of a class's conception of farmers, the "happy-sad," "serious-funny" continua would be examples of those that would probably not yield useful information. It would not matter, of course, how these adjectives were placed.

Interpreting a Semantic Differential. When your students have registered their attitude toward farmers or geography, or whatever the subject you want to evaluate, you will want to determine a class average for each continuum of interest to you. Assume you are working with the "unimportant-important" continuum. You would begin by assigning a value from 1 to 7 for each of the seven spaces between these adjectives. The student markings in the space to the far right would carry the value of 1 and those on the far left a 7. Each space in between carries an appropriate value between these extremes. First, total the number of students who have

marked space 1 and multiply by one, then total the number of 2's and multiply by two, and so on through the seven spaces. Then divide by the total number of students and you will have a weighted average for your class. As an example:

FARMERS

| | 7 | 6 | 5 | 4 | 3 | 2 | 1 | |
|---|---|---|---|---|---|---|---|---|
| important | ___ | ___ | ___ | ___ | ___ | ___ | ___ | unimportant |
| | ___ | ___ | ___ | ___ | ___ | ___ | ___ | |

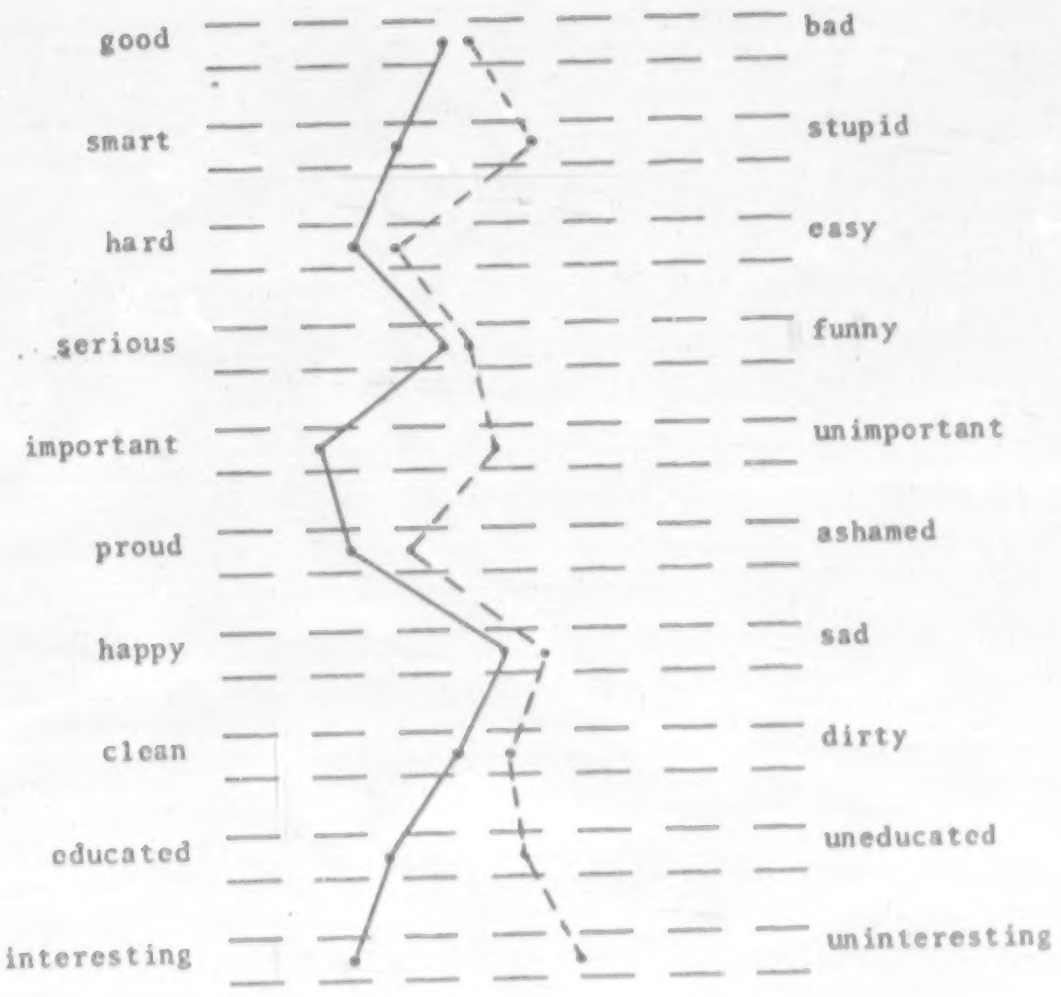
Suppose your class of 20 students reacted to the above continuum in the following way:

| | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| 2 | students | marked | space | 1 | giving | that | space | a | total | value | of 2 |
| 3 | " | " | " | 2 | " | " | " | " | " | " | " 6 |
| 6 | " | " | " | 3 | " | " | " | " | " | " | " 18 |
| 6 | " | " | " | 4 | " | " | " | " | " | " | " 24 |
| 0 | " | " | " | 5 | " | " | " | " | " | " | " 0 |
| 3 | " | " | " | 6 | " | " | " | " | " | " | " 18 |
| 0 | " | " | " | 7 | " | " | " | " | " | " | " 0 |
| | | | | | | | | | TOTAL | | 68 |

The total (68) divided by the number of students (20) gives you a mean value for this continuum of 3.40. When you have determined a mean value like this for each continuum of interest to you, a class profile for this concept can be drawn.

If you had administered this same instrument before and after an instructional unit, you might obtain profiles like those on the following page. They indicate information about changes in the attitudes of your class as a result of the lessons you had prepared.

Farmers




pretest class profile - - - - -
posttest class profile _____

* * *

The Likert Scale

Constructing a Likert Scale. The measurement device exemplified in Part IV of the evaluation instrument was

developed by Rensis Likert. It is probably the most easily constructed and widely used scale presently available for measuring attitudes. With this device the evaluator formulates statements that would reveal attitudes that are relevant to the topic being studied. For example, if race relations was being studied and you wanted to evaluate your class's attitude about this topic, you might devise statements similar to these:

1. I would welcome Negroes in my place of business.
2. Chinese should not be allowed in our country.
3. Indians are born criminals.

The respondents must react to the statement by marking a five point continuum, from "strongly agree," to "agree," "uncertain," "disagree," and "strongly disagree."

Write these attitude statements so that they appear meaningful and interesting, even exciting, to the students. When the Likert technique has been used unsuccessfully, it is usually because the statements have failed to arouse much interest in the respondents. If you are producing appropriate attitude statements, your respondents probably will not quibble or want to change statements. Also, large numbers of "uncertain" responses or statements skipped by students should indicate that statements are not functioning well.

Interpreting a Likert Scale. After your students have registered their reaction to each statement on your

scale, you will determine a class mean for each statement. This is done similarly to the method employed with the semantic differential and other attitudinal scales already discussed. Each of the five response positions is assigned a weight of 5, 4, 3, 2, or 1. If you decide that a high score on the item or statement would indicate a favorable attitude, then favorable statements must be scored 5 for "strongly agree," down to 1 for "strongly disagree." Likewise, unfavorable statements must be scored 1 for "strongly agree" up to 5 for "strongly disagree."

Some examples may be helpful here. If you were teaching a unit on United States foreign policy and wanted to evaluate your students' attitudes toward this policy, you might develop a scale to do so that included the following items.

1. The U.S. should drop its tariffs on products coming from Latin America. SA A U DA SDA
2. The U.S. should terminate all military alliance agreements with foreign nations. SA A U DA SDA

If you decided that a high score on statement 1 would indicate a favorable attitude, you would record a 5 for every student who registered a "strongly agree," moving down to recording a 1 for every student who strongly disagreed. A class mean for the statement would be determined by adding these weightings and dividing by

the total number of students in the class.

Similarly, you might decide that statement 2 represented an unfavorable statement. If this were so, you would record a 1 for every student who registered a "strongly agree," up to a 5 for every student marking "strongly disagree." The class mean would, of course, be determined in the same way as for statement 1.

There is no easy way to graph the results of the Likert Scale as there is for the semantic differential. Changes that might take place in the attitudes of your group from pre-unit to post-unit evaluations, however, can be clearly demonstrated by changes in the class means that are obtained.

## PART IV: USING FEEDBACK EVALUATION

In this part of the kit you will work a programmed exercise to instruct yourself about the uses of evaluation data as feedback to improve teaching. When you have worked the exercise, your instructor will lead a class discussion about it.

The materials needed for this part include: the program and its answer sheet, a handout sheet, "Some Objectives or Desired Learning Outcomes for the Game of Farming," and the "Evaluation Instrument for the Game of Farming," on pages 20 to 25 of this Manual.

A programmed learning exercise is not like a test although it might resemble a test. A program is a method of presenting information, like a reading interspersed with questions that you must answer. Your answers indicate that you understand the material being presented. Although you have an answer sheet on which to record your responses to the questions, only you will look at the sheet. The answer sheet serves to point out the questions that you have missed so that you are able to correct your errors. More specific directions for the program are included with it.

## PART V: APPLICATION

During the final two hours of work on this kit, you will have an opportunity to apply some of the techniques and ideas that you worked with in previous parts of the kit. You will work with a list of objectives for another classroom activity, "Portsville." This list is found on pages 44-46 of this Manual. If you participated in the kit dealing with simulation, the "Portsville" activity will be familiar to you. ("Portsville" is a classroom activity in the High School Geography Project's unit, Geography of Cities, published by The Macmillan Company.) After you have read the objectives, you view a video tape of students participating in the activity to see how the objectives are actually taught. Using this background, you will devise items and scales to measure the attainment of the activity's objectives.

Some materials are provided from which you can generate test items to measure the knowledge or intellectual skill objectives. A sketch map of the hypothetical community "Holly Bay" is found on page 47 of this Manual. Also, your instructor will hand out the "New Orleans East" topographic maps that you worked with in another HSGP kit. You may remember from the reading "Constructing and Interpreting an Evaluation Instrument," assigned in Part III, that it is a good idea to structure questions

in a "fresh setting" when possible. For example, if students have been taught the use of map scale or the principles governing land use relationships on a map of "Portsville" (Seattle, Washington, in reality), they should be asked to demonstrate this learning on some other map. This transfer raises the level of understanding necessary to answer the item correctly and also serves to condition students away from memorizing without understanding.

Educational Objectives for "Portsville"

In addition to the more specific knowledge objectives listed below, some social and attitudinal objectives are very important. Objectives one and two are most important among these.

1. The student completing this activity will be better able to participate in making group decisions. Working in a group to build a model of a city should improve a student's ability to function effectively in other group decision-making situations.

2. At the conclusion of this activity, the student's attitude toward the city will have been modified:

   a. He will find the city a more interesting topic to study.

   b. No longer overwhelmed by the city's size

and complexity, he should be able to see the city as a comprehensible whole, an assemblage of rational parts.

At the conclusion of the activity, the student will be improved in certain knowledge and intellectual skills. He should be better able to:

3. Predict where different kinds of urban land use are likely to be located. For example, given a detailed map of an urban area and asked to predict the most probable locations for different types of land use, the student locates heavy industry along water and rail routes, shopping and recreational centers adjacent to residential areas, and high cost single-family dwellings on the outskirts of the city.

4. Explain why different kinds of urban land use may be located where they are. For example, when asked to explain why heavy industry is located near water or rail transportation, the student refers to the need of such industry to be accessible to both raw materials and markets.

5. Explain why a city grows or declines. For example, told that a city of 500,000 now prospers where a small settlement once existed and asked what information he would need to account for this growth, he mentions information about the transportation connections

with other areas, the goods and services produced by the city, the pattern of population growth in the overall area, and the availability of natural resources.

6. Read and interpret the scale of a map. For example, given a map with its scale on it, and asked to indicate which shopping centers would be conveniently accessible to a person walking from any given point in the city, the student does so.

7. Cite examples showing how people have modified their physical environment and adapted to it. For example, given a large scale map of New Orleans and asked to cite specific examples where the people have either modified their physical environment or adapted to it, the student points out several examples.

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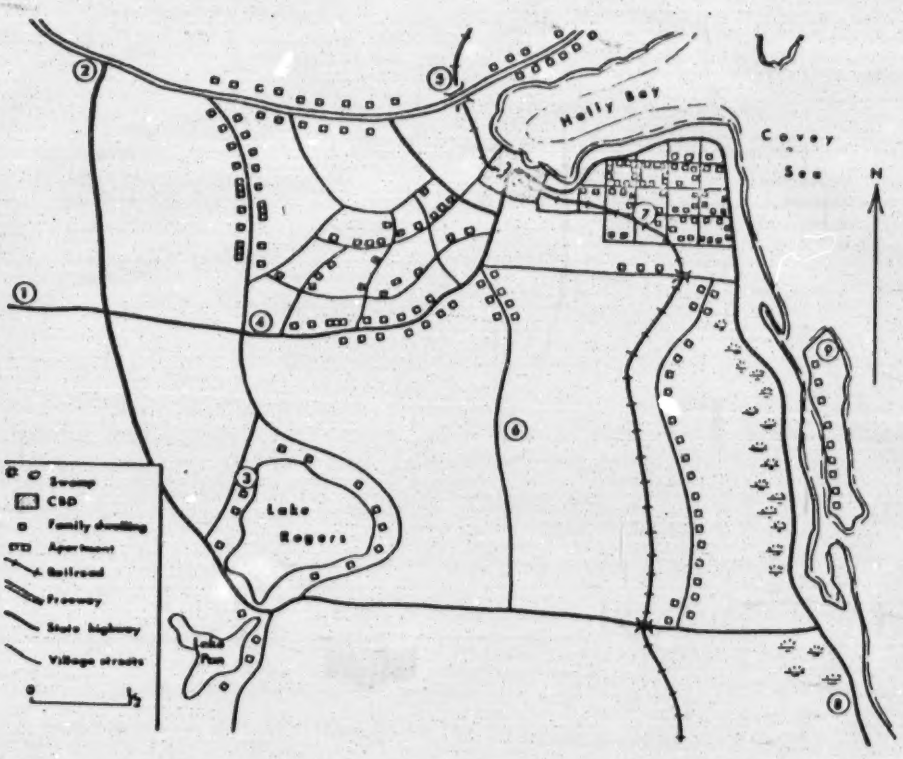
# HOLLY BAY COMMUNITY



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This is currently the best compilation of writings on evaluating social studies learnings. Chapter One is an exceptionally useful general introduction to the field of evaluation. Chapters Three and Eight provide useful summaries of procedures for writing objective and essay tests.

Ebel, Robert L., Measuring Educational Achievement, Englewood Cliffs, New Jersey: Prentice-Hall Inc., 1965.

This general reference is considered a classic in the field of educational measurement. The volume is useful in the planning, constructing and interpreting of tests for knowledge and intellectual skill objectives.

Fenton, Edwin, The New Social Studies, New York: Holt, Rinehart and Winston, Inc., 1967.

Fenton's work contains a useful chapter which discusses priorities among the objectives in the social studies.

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A highly readable summary of the techniques available for attitude measurement.

Osgood, Charles E. et al., The Measurement of Meaning, Urbana: University of Illinois Press, 1957.

An explanation of the semantic differential technique, this work is technical and intended for the sophisticated evaluator.

Wilhelms, Fred T. (ed.), Evaluation as Feedback and Guide, Washington, D.C.: Association for Supervision and Curriculum Development, 1967.

Chapter One is a good general summary of the argument for using evaluation as feedback to improve instruction. Other chapters are worthwhile but tend not to be as specific and practical as Berg's work, Evaluation in the Social Studies.